CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS FOR THE CONTROL OF METHYLMERCURY AND TOTAL MERCURY IN THE SACRAMENTO-SAN JOAQUIN DELTA ESTUARY

Staff Report

Draft Report for
Public Review

February 2008

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE OF CALIFORNIA
Arnold Schwarzenegger, Governor

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
Linda S. Adams, Secretary

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
Karl E. Longley, Chair
Katherine Hart, Vice Chair
Paul Betancourt, Member
Cheryl K. Maki, Member
Sandra O. Meraz, Member
Sopac Mulholland, Member
Dan Odenweller, Member

———

Pamela C. Creedon, Executive Officer

———

11020 Sun Center Drive #200
Rancho Cordova, CA 95670

———

Phone: (916) 464-3291

eMail: info5@waterboards.ca.gov
Web site: http://www.waterboards.ca.gov/centralvalley/

DISCLAIMER

This publication is a technical report by staff of the California Regional Water Quality Control Board, Central Valley Region. The Central Valley Water Board has not adopted or approved of the proposed policies and regulations contained in this report.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin Delta Estuary

Staff Report

Draft Report for Public Review

February 2008

REPORT PREPARED BY:

Michelle L. Wood
Patrick W. Morris
Janis Cooke, Ph.D.
Stephen J. Louie
David H. Bosworth

ACKNOWLEDGEMENTS

Central Valley Water Board staff gratefully acknowledges the valuable analytical, editorial and administrative support from: Melanie Medina-Metzger (former staff with the Mercury TMDL Unit), Helena Kulesza (Student Intern), and Theresa Schultz (Schultz Consulting).

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS FOR THE CONTROL OF METHYLMERCURY AND TOTAL MERCURY IN THE SACRAMENTO-SAN JOAQUIN DELTA ESTUARY

Draft Staff Report for Public Review

EXECUTIVE SUMMARY

This Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff report describes a proposal to amend the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins to address the regulation of methylmercury and total mercury in the Sacramento-San Joaquin Delta Estuary (the Delta). Central Valley Water Board staff will circulate this staff report and the enclosed draft Basin Plan amendments for public review and comment prior to Central Valley Water Board consideration. The section following the Table of Contents provides the recommended format for comment submittal.

Major components of the proposed Basin Plan amendments are:

- Addition of a beneficial use designation of commercial and/or sport fishing (COMM) for the Delta;
- Numeric objectives for methylmercury in fish tissue that are specific to the Delta;
- An implementation plan for controlling methylmercury and total mercury sources; and
- A surveillance and monitoring program.

The Delta is on the Clean Water Act Section 303(d) List of Impaired Water Bodies because of elevated levels of mercury in fish. The goal of the proposed Basin Plan amendments is to lower fish mercury levels in the Delta so that the beneficial uses of fishing and wildlife habitat are attained.

Proposed Modifications to Basin Plan Chapter II (Existing and Potential Beneficial Uses)

Staff proposes the addition of the commercial and sport fishing (COMM) beneficial use for the Delta. The recommendation is to add the COMM designation as a potential, rather than existing, beneficial use because the recommended fish tissue objectives are not yet achieved throughout the Delta.

Proposed Modifications to Basin Plan Chapter III (Water Quality Objectives)

Staff proposes numeric objectives for methylmercury in fish tissue (referred to as fish tissue objectives) for the Delta. Methylmercury is the most toxic form of mercury and accumulates in successive levels of the food chain. It is a neurotoxicant that adversely affects reproductive and immune systems in humans and wildlife that consume fish. Nearly all methylmercury is acquired through consumption of mercury contaminated fish and shellfish.

Staff evaluated five alternatives for the fish tissue objectives, including no action and a range of fish tissue objectives that are based on varying the amount and the trophic level of fish that can be safely consumed by humans. The recommended alternative would establish Delta-specific methylmercury fish tissue objectives of 0.08 and 0.24 mg/kg, wet weight, in fish tissue for large trophic level 3 and 4 fish (150-500 mm total length) and 0.03 mg/kg, wet weight, for small trophic level 2 and 3 fish (less than 50 mm). The proposed objectives are protective of threatened and endangered wildlife species that consume large and small Delta fish. In addition, the proposed objectives allow people to safely eat 32 g/day (eight ounces, uncooked, per week) of a mixture of Delta fish along with a moderate amount of commercial fish. The 32 g/day consumption rate is consistent with the consumption rate that the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) staff used to calculate the fish methylmercury objective for San Francisco Bay, which was approved by the State Water Resources Control Board in July 2007.

Proposed Modifications to Basin Plan Chapter IV (Implementation)

To achieve the proposed fish tissue objectives, staff proposes an implementation plan with actions and time schedules to reduce methyl and total mercury sources to the Delta. Available information indicates that achieving an annual average methylmercury (unfiltered) concentration of 0.06 ng/l in ambient Delta waters should enable attainment of the proposed fish tissue objectives. The goal of 0.06 ng/l methylmercury in ambient water is used to determine how much existing methylmercury inputs to the Delta need to be reduced to achieve the proposed fish tissue objectives throughout the Delta.

Sources of methylmercury in Delta waters include tributary inputs from upstream watersheds and within-Delta sources such as sediment flux from wetlands and open water habitats, municipal and industrial wastewater, agricultural drainage, urban runoff, and atmospheric deposition. Available information indicates that about 60% of methylmercury loads to the Delta come from tributary inputs and about 40% come from within-Delta sources. Methylmercury flux from sediments in wetland and open water habitats in the Delta provides most of the within-Delta loads (31% of all loads to the Delta). Wastewater treatment plants and agricultural runoff account for about 4% and 3% of methylmercury loads to the Delta, respectively. Separate methylmercury allocation systems are required for the different hydrologic areas of the Delta because fish mercury impairment and the type and amount of the methylmercury inputs to each area are substantially different. For example, wetland habitat within the Yolo Bypass subarea may contribute almost as much methylmercury to the subarea as its tributaries, compared to the Sacramento and San Joaquin subareas, which receive substantially more methylmercury loading from their tributaries.

The implementation plan also includes requirements for total mercury evaluation and minimization programs for municipal wastewater and stormwater dischargers expected to increase due to population growth, improvements to the Cache Creek Settling Basin trapping efficiency, and total mercury load reductions from mercury-contaminated watersheds. These activities should achieve the five-year average total mercury load decrease of 110 kg/yr required by the San Francisco Bay mercury control program and reduce the amount of mercury available for methylation in Delta open-water and wetland habitats.

Many implementation alternatives are possible for reducing loads from the various methyl and total mercury sources. For this draft report, staff identified eleven considerations that could guide the implementation program, evaluated a variety of options for each consideration, formulated three alternatives based on those options, and analyzed the alternatives against evaluation criteria to select a preferred alternative. Staff recommends the adoption of an implementation plan that has the following major components:

- Incorporate **methylmercury allocations** for methylmercury point and nonpoint sources in the Delta and Yolo Bypass.
- Incorporate a **methylmercury characterization and control study period** as Phase 1 (e.g., 2008-2015) of the implementation program. The characterization and control studies are required for large wastewater treatment plants that discharge greater than 0.06 ng/l unfiltered methylmercury and large municipalities that discharge to Delta subareas where the proposed fish tissue objectives are exceeded. Irrigated agricultural lands and wetlands that discharge to Delta subareas where the proposed fish tissue objectives are exceeded are required to conduct methylmercury characterization studies; those that, per the results of completed characterization studies, act as a net source of methylmercury to the Yolo Bypass or Delta, shall conduct methylmercury control studies. Responsible parties within each source category may develop either individual or collaborative studies.
- The Phase 1 methylmercury characterization and control studies will evaluate methyl and total mercury concentrations and loads in source and receiving waters and discharges, identify variables that control methylmercury production, and propose management practices and implementation schedules to reduce discharge methylmercury loads and concentrations.
- Incorporate **Phase 1 methylmercury concentration limits** for large NPDES municipal WWTPs and municipal stormwater dischargers in the Delta and its upstream tributary watersheds downstream of major dams. The Phase 1 limits should be maintained during Phase 1 and in Phase 2 until facilities achieve their methylmercury waste load allocations or other effluent limits established for Phase 2. The Phase 1 limits are equal to each discharger's baseline annual average effluent methylmercury concentrations.
- Require agencies responsible for water management to characterize and limit increases in methylmercury loading that could result from changes to flood conveyance in the Yolo Bypass, salinity standards in the Delta, and other water management practices that may affect Delta methylmercury levels.
- Require responsible parties for new methylmercury sources that begin discharge between the amendment adoption date and 2015 to participate in group or individual source characterization and control studies.
- By 2015, staff will review study results, methylmercury control options, and methylmercury allocations, revise the TMDL, and recommend changes to the methylmercury control program. The Central Valley Water Board could consider a Basin Plan amendment for an updated methylmercury control program.
- For **Phase 2** of the methylmercury control program (after 2015), responsible parties would implement approved methylmercury control actions based on the results from the Phase 1 studies and ongoing CalFed studies. Full compliance with the methylmercury allocations

is required by 2030, or sooner if required by Central Valley Water Board adopted implementation schedules.

- Incorporate a schedule for establishing **total mercury** evaluation and minimization programs during Phase 1 for large point sources in the Delta and its tributary watersheds downstream of major dams.
- Incorporate guidance for **pilot mercury offset projects** that may take place during Phase 1 and propose a schedule for developing a mercury offset program for Central Valley Water Board consideration at the end of Phase 1.
- Incorporate guidance for accruing credit for dischargers that can document reductions in methyl and total mercury discharges before the effective date of the proposed Basin Plan amendments. Total mercury and methylmercury credits accrued as a result of early effluent quality improvements and as a result of any pilot offset project that is completed may be used to extend time schedules for compliance with methylmercury waste load allocations by five years.
- Require large NPDES facilities, large NPDES stormwater dischargers, and agencies creating new wetland projects that have the potential to discharge methylmercury to develop and implement a mercury **risk management program** for people that eat Delta fish.
- Incorporate a schedule for entities responsible for Cache Creek Settling Basin operations and maintenance to propose and implement improvements to the basin to reduce its mercury loading to the Yolo Bypass.
- Include requirements for dredging projects in the Delta to ensure that there will be no net increase in methylmercury and total mercury loads from dredging activities in Delta waterways or from the disposal of dredged materials.

Proposed Modifications to Basin Plan Chapter V (Surveillance and Monitoring)

Staff proposes a surveillance and monitoring program to ensure compliance with the fish tissue methylmercury objectives and methylmercury and total mercury reduction strategy proposed for addition to Chapters III and IV. The program includes fish tissue, water, and sediment monitoring.

Environmental Analysis

To satisfy requirements of the California Environmental Quality Act (CEQA), staff performed an environmental analysis of the potential impacts of the proposed Basin Plan amendments. Adoption of the proposed Basin Plan amendments will not by itself have a physical effect on the environment, nor will the Phase 1 studies. However, implementation actions taken by responsible entities to comply with some components of the proposed implementation plan and improvements to the environment by controlling mercury could also have unintended, adverse impacts on the environment. The environmental analysis determined that implementation of the proposed Basin Plan amendments could result in potentially significant impacts to biological resources, hydrology/water quality, and utilities/service systems, unless mitigation is incorporated. The staff report summarizes reasonable actions to reduce the potential impacts from implementation projects. With one exception, all potential impacts are expected to be

limited and mitigated to less than significant levels, if not completely avoided, through careful project planning, design, and implementation.

The environmental analysis found that implementation of methylmercury management practices to achieve safe fish mercury levels in the Yolo Bypass has the potential to result in cumulatively considerable impacts to habitat that supports endemic species with limited geographic ranges, such as Sacramento splittail and Delta smelt. Until the Phase 1 characterization and control studies have been completed, it is unknown whether the wetlands that act as substantial methylmercury sources in the Yolo Bypass also provide critical habitat to endemic species and whether it will be possible to avoid all potentially significant impacts. However, the environmental analysis identified several methods to minimize negative effects on wetland function, including: implement only those onsite methylmercury management practices that do not change desirable wetland functions, focus implementation of management practices on wetland habitats that do no support endemic species with a limited geographic range, reduce upstream methylmercury sources and/or sources of mercury-contaminated sediment that supply the wetland sites, and, for new habitat restoration projects, locate new wetlands away from mercury contaminated watersheds.

The implementation of the proposed Basin Plan amendments will result in overall improvement in water quality in the waters of the Delta region and will have significant positive impacts to the environment and public health over the long term by enabling humans and wildlife to safely consume Delta fish.

Page intentionally left blank.

DRAFT BASIN PLAN AMENDMENTS

Text additions to the existing Basin Plan language are underlined and text deletions are indicated by ~~strikethrough~~. (NOTE: For this review edition, underline is not used for ease of reading; everything below is new language) Revise Basin Plan sections as follows:

Revise Chapter II (Existing and Potential Beneficial Uses), Table II-1 for Sacramento San Joaquin Delta:

Footnote (9) COMM is a POTENTIAL beneficial use for waterways listed in Appendix 43.

Revise Chapter III (Water Quality Objectives), Methylmercury, to add as follows:

The following fish tissue objectives apply to the Sacramento-San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43. The average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150-500 mm total length). These objectives are protective of (a) humans eating 32 g/day of commonly consumed, large fish; and (b) all wildlife species that consume large fish. The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length. This objective is protective of wildlife species that consume small fish.

Revise Chapter IV (Implementation), under "Mercury Discharges in the Sacramento River and San Joaquin River Basins" to add:

Delta Mercury Control Program:
The goal of the mercury control program is to reduce methylmercury exposure to humans and wildlife in the Delta and Yolo Bypass waterways listed in Appendix 43. Actions are needed in the Delta and upstream tributaries to achieve the fish tissue objectives. The Delta Mercury Control Program includes mercury and methylmercury control requirements for the Delta and some upstream sources. Future upstream control programs are planned for tributaries to the Delta through which control actions will be implemented to meet load allocations for tributary inputs assigned by the Delta control program and to achieve the fish tissue objectives throughout the Delta.

Fish tissue methylmercury concentrations are directly linked to the concentration of methylmercury in the water. Reducing average annual methylmercury concentrations in ambient water to the methylmercury (unfiltered) goal of 0.06 ng/l should achieve the Delta fish tissue objectives. The methylmercury goal for ambient Delta waters incorporates an explicit margin of safety of 10%.

The ambient water methylmercury goal of 0.06 ng/l is used to determine the following: reductions required from existing methylmercury inputs to the Delta to achieve the fish tissue objectives; responsible parties required to conduct **Phase 1 Characterization and Control Studies**; and Phase 1 effluent methylmercury concentration limits for existing facilities that discharge effluent with annual average methylmercury concentrations less than 0.06 ng/l. From [the effective date of this amendment] through [eight years after the effective date of this amendment], the 0.06 ng/l goal will not be used as an effluent limit for discharges with annual average methylmercury effluent concentrations greater than 0.06 ng/l. After [eight

years after the effective date of this amendment] the Regional Water Board will reevaluate the 0.06 ng/l methylmercury goal and determine at that time which, if any, effluent limit adjustments are necessary. After [eight years after the effective date of this amendment], the methylmercury goal of 0.06 ng/l will not be established as an effluent limit in permits unless the Regional Water Board makes that determination and amends the Basin Plan.

In some areas of the Delta substantial reductions in methylmercury inputs are necessary to achieve the fish tissue objectives. Attainment of the methylmercury allocations set forth in this control program is expected to result in achieving the fish tissue objectives. Methylmercury allocations will be achieved chiefly by implementation of actions to address the methylmercury and total mercury sources in the Delta, Yolo Bypass and tributary watersheds and in part by natural erosion processes that remove total mercury that has deposited in creek beds and banks since the beginning of mining in the Central Valley. Allocations for point and non-point sources are listed in tables contained in this section. Allocations are specific to Delta subareas, which are shown on Figure IV-4. New or expanded methylmercury discharges that begin after the effective date of this amendment may necessitate adjustments to the allocations.

The concentration of total mercury in sediment is one factor controlling methylmercury production. Point and nonpoint sources contribute total mercury to the Delta. The control program includes requirements for controlling total mercury discharges from point and nonpoint sources. The control program includes requirements to begin reducing total mercury loading to San Francisco Bay, as required by Resolution R2-2006-0052.

Methylmercury allocations and Phase 1 methylmercury concentration limits for dischargers and discharger groups are listed in the tables following this section. Allocations for dischargers in the Delta and Yolo Bypass shall be met no later than 2030, unless the Regional Water Board amends the allocations and implementation provisions.

The Regional Water Board intends to implement the mercury control program in two phases. During Phase 1 ([the effective date of this amendment] through [eight years after the effective date of this amendment]), dischargers will conduct studies that will help the Regional Water Board determine whether allocation adjustments are warranted. During Phase 1, dischargers will implement actions to control discharges to minimize increases in mercury and methylmercury discharged to the Delta. Phase 1 also includes development of a program to reduce mercury related risks to humans.

At the end of Phase 1, the Regional Water Board will consider whether there needs to be adjustments to the methylmercury allocations and the mercury control program. The Regional Water Board will re-evaluate the methylmercury allocations for all sources. During Phase 2 (from [eight years after the effective date of this amendment] through 2030), dischargers will implement methylmercury control programs based on the Phase 1 findings.

When implementing the wasteload allocations in this control program, the Regional Water Board may include schedules of compliance in NPDES permits that give permittees up to 2030 to comply with water quality-based effluent limits based on the wasteload allocations. The compliance schedules in the permits must be as short as possible and must be consistent with the requirements of the Clean Water Act, EPA regulations at 40 CFR 122.476, and State law and regulations.

Monitoring specifications for methylmercury in fish and water are defined in Chapter V (Monitoring and Surveillance).

For this section, annual average concentrations and annual loads for methylmercury and total mercury are defined as the average concentration or load for a calendar year (January through December).

Phase 1 Characterization and Control Studies

Phase 1 of the control program requires dischargers to conduct mercury and methylmercury **Characterization and Control Studies.** Characterization Studies shall evaluate methylmercury and total mercury concentrations and loads in source waters, receiving waters, and discharges. Control Studies shall identify variables that control methylmercury production; develop methylmercury control methods; evaluate the effectiveness, costs, and potential environmental effects of identified methylmercury control actions; and propose implementation schedules to comply with methylmercury allocations.

As described in the following sections, methylmercury and total mercury **Characterization and Control Studies** are required for:

- Irrigated agricultural lands and managed wetlands that discharge to the Yolo Bypass and Delta subareas that require methylmercury source reductions.
- New wetland and wetland restoration projects scheduled for construction anywhere in the Delta or Yolo Bypass during Phase 1.
- Existing NPDES permitted facilities in the Delta and its tributary watersheds downstream of major dams[1] listed in Table C and new facilities constructed during Phase 1 that discharge effluent with annual average methylmercury concentrations greater than 0.06 ng/l.
- Sacramento Area Municipal Separate Storm Sewer System (MS4), Stockton MS4, and Tracy MS4 service areas within and upstream of the legal Delta boundary.
- New flood conveyance, water management, and salinity control projects that have the potential to increase ambient mercury and/or methylmercury levels in the Delta or Yolo Bypass.
- Cache Creek Settling Basin outflow to the Yolo Bypass.

Dischargers may work individually or develop collaborative **Characterization and Control Studies**. However, if no acceptable characterization and control studies are undertaken, then the methylmercury allocations and Phase 1 methylmercury concentration limits specified in the following sections will remain in effect at the end of Phase 1.

If the studies indicate that achieving a given methylmercury allocation is infeasible, then the discharger, or an entity representing a discharger, shall provide a management plan and implementation schedule to achieve partial compliance along with detailed information documenting why achieving the full allocation is infeasible.

[1] Major reservoirs and lakes in the Sacramento Basin are Shasta, Whiskeytown, Oroville, Englebright, Camp Far West, Folsom, Black Butte, Indian Valley, Clear Lake and Lake Berryessa. Major reservoirs and lakes in the San Joaquin Basin are Camanche, New Hogan, New Melones/Tulloch, Don Pedro, McClure, Burns, Owens, Eastman, Hensley, Millerton and Marsh Creek.

Regional Water Board staff will work to form a technical advisory committee (TAC) of independent, nationally or internationally recognized mercury experts to review study designs, evaluate results, propose follow-up experiments, and make recommendations on whether sufficient information is available to implement management practices. By [one year after the effective date of this amendment], staff will report to the Regional Water Board the progress towards formation of the technical advisory committee.

In general, the schedule described below applies to all discharger categories. Specific requirements for each discharger category are included in other sections.

1. By (one year after the effective date of this amendment) each discharger, or entities representing dischargers, shall provide to Regional Water Board staff a report that describes how individual dischargers or groups of discharger or coalitions will implement the **Characterization and Control Studies**. For dischargers conducting coordinated studies, the report shall include a list of the dischargers that will participate in the study.
2. Dischargers, discharger groups, or entities representing dischargers, shall submit **Characterization and Control Studies** work plans by [two years after the effective date of this amendment] to Regional Water Board staff for approval by the Executive Officer. The work plans will contain a general description of all the studies that need to be done for the **Characterization and Control Studies** and a detailed work plan for the initial work to be accomplished in the following two years. The TAC may review the work plans and provide input indicating whether the studies are likely to characterize methylmercury production and control. Staff will review the work plans, including the recommendations of the TAC, and report to the Regional Water Board on whether satisfactory progress is being made.
3. By [four years after the effective date of this amendment], dischargers, or entities representing dischargers, shall submit a report to Regional Water Board staff documenting progress towards complying with the study requirements and management practice development. The report shall include work plans for any additional studies needed to address methylmercury and total mercury characterization or control. The TAC may evaluate the scientific basis of the findings to date and recommend what additional studies should be undertaken to complete the objectives of the Characterization and Control Studies. Staff will review the work plans (including the recommendations of the TAC) and report to the Regional Water Board on whether satisfactory progress is being made.
4. By [seven years after the effective date of this amendment], the dischargers, or entities representing dischargers, shall complete the studies and submit to Regional Water Board staff a final report that presents the study results and descriptions of methylmercury control options, their preferred methylmercury controls, and implementation schedules for achieving methylmercury allocations. The reports may contain a statement from the TAC on whether they agree with the study findings and whether the preferred management practices are ready for implementation.

At the end of Phase 1, the Regional Water Board will evaluate the completed studies, the effectiveness and costs of identified methylmercury controls, preferred management practices, implementation schedules, and environmental effects of potential methylmercury control actions. The Regional Water Board will consider: modification of methylmercury goals, objectives, or allocations; adoption of management practices and implementation

schedules for methylmercury controls; and adoption of a Mercury Offset Program to compensate for loads in excess of the methylmercury allocations.

If the Regional Water Board determines that existing and new dischargers are making sufficient progress towards completing the **Characterization and Control Studies**, it may consider extending the time for the studies' completion and implementation of control options. If insufficient progress is made the Regional Water Board may consider a prohibition of individual methylmercury discharges or other control options.

Dischargers in the Central Valley that are not subject to the Delta Mercury Control Program but may be subject to future mercury control programs in upstream tributary watersheds should consider participating in the coordinated mercury control studies during Phase 1. If such dischargers actively participate in the studies, they may be exempt from conducting their own individual studies as part of any future upstream mercury control programs.

The Regional Water Board will acknowledge early implementation of mercury and methylmercury controls by Central Valley dischargers and grant credit towards meeting future allocations and implementation requirements as they are developed for sources upstream of the Delta (see section on Pilot Mercury Offset Projects).

Discharger-Specific Study Requirements and Other Specifications

The following sections include discharger-specific requirements for methylmercury Characterization and Control Studies, total mercury load reductions and other conditions that must be met during Phase 1.

Agricultural Lands and Wetlands

Methylmercury allocations listed in Table A apply to agricultural lands and wetlands in the Delta and Yolo Bypass (Figure A43-4). The allocations for each subarea apply to the sum of annual methylmercury loads produced by agricultural lands and wetlands in each subarea. The subarea allocations apply to agricultural and wetland discharges that existed since [the effective date of this amendment] and new discharges that began after [the effective date of this amendment]. The methylmercury allocations shall be achieved no later than 2030.

Characterization Studies are required for those irrigated agricultural lands and managed wetlands that discharge to the subareas of the Delta that require methylmercury source reductions (Yolo Bypass, Sacramento, Mokelumne/Cosumnes, San Joaquin, and Marsh Creek subareas; Figure A43-4). Irrigated agricultural lands and managed wetlands that discharge to the Central Delta and West Delta subareas (Figure A43-4) shall conduct Characterization Studies only if changes are made to existing land uses that have the potential to increase ambient methylmercury levels (e.g., restoration activities that convert agricultural lands to wetlands).

Those irrigated agricultural lands and managed wetlands that both discharge to subareas that require methylmercury source reductions and, per the results of completed Characterization Studies, act as a net source of methylmercury to the Yolo Bypass or Delta, shall conduct **Control Studies**. Within a subarea, individual dischargers do not need to complete individual studies if the Executive Officer approves a comprehensive, coordinated

study plan that will provide a characterization of discharges within the subarea and will propose a coordinated plan for achieving subarea load allocations.

Proponents of new wetland and wetland restoration projects scheduled for construction during Phase 1 either shall participate in a comprehensive study plan as described above or shall implement a site-specific study plan, evaluate practices to minimize methylmercury discharges, and implement newly developed management practices as feasible. Wetland projects may include pilot projects to demonstrate which management practices minimize methylmercury discharges. Projects shall include monitoring to demonstrate effectiveness of management practices.

The Yolo Bypass is a significant source of methylmercury to the Delta. Water management agencies responsible for flooding the Yolo Bypass and landowners within the Bypass shall develop and submit a comprehensive, coordinated study plan that will provide a characterization of methylmercury production and discharge from lands immersed by managed flood flows within the Bypass. The study plan should include a coordinated plan for developing methylmercury control measures to achieve Bypass allocations.

For development projects requiring water quality certifications or waste discharge requirements that require compensatory and/or mitigation wetlands, the water quality certifications or waste discharge requirements shall require the compensatory wetlands to include measures to control methylmercury consistent with the wetland requirements of this Delta Mercury Control Program.

NPDES Wastewater Treatment Facilities

Methylmercury. Methylmercury wasteload allocations apply to the annual methylmercury loads discharged by NPDES permitted facilities that discharge to the Delta and Yolo Bypass (Table B) and shall be achieved no later than 2030.

Beginning in [three months after the effective date of this amendment], all facilities identified in Tables B and C shall monitor methylmercury and total mercury in their effluent and receiving water and include their monitoring results and annual average concentration calculations in annual monitoring reports to the Regional Water Board. Chapter V contains methylmercury monitoring specifications. The Regional Water Board may require facilities not listed in Table C to monitor methylmercury and total mercury based on facility- and receiving water-specific conditions.

Tables B and C contain Phase 1 methylmercury concentration limits for NPDES facilities in the Delta, Yolo Bypass and tributary watersheds downstream of major dams. The Phase 1 methylmercury limits apply to the annual average methylmercury concentration in effluent discharged by the facilities to receiving waters. The Phase 1 methylmercury concentration limits shall be incorporated into NPDES permits. As necessary, the NPDES permit may include a compliance time schedule to achieve the Phase 1 limit, not to exceed [ten years after the effective date of this amendment].

The Phase 1 methylmercury concentration limits shall become effective in January 20XX [the third year after the effective date of this amendment]. The facilities shall maintain the limits throughout the duration of Phase 1. The Phase 1 methylmercury concentration limits also shall apply in Phase 2 until facilities achieve their methylmercury wasteload allocations or other effluent limits established for Phase 2.

To account for the projected population growth in the Delta region and associated discharges from new municipal WWTPs constructed in each Delta subarea, Table B contains unassigned wasteload allocations for new municipal WWTPs. In addition, effluent methylmercury data were not available for several facilities in the Delta's tributary watersheds downstream of major dams at the time the Delta Mercury Control Program was approved. Such existing and new facilities shall conduct monthly effluent monitoring for methylmercury and shall have methylmercury concentration limits set equal to the annual average effluent methylmercury concentration calculated from their first 12 months of monitoring, or 0.06 ng/l, whichever is higher. The Phase 1 methylmercury concentration limits for these facilities shall be established in the their NPDES permits. New facilities will be assigned facility-specific allocations at the end of Phase 1.

Dischargers identified in Table C shall complete the **Characterization and Control Studies** and shall evaluate the feasibility of reducing their methylmercury discharge concentrations to achieve both their assigned allocations (for those that discharge to the Delta or Yolo Bypass; see Table B) and 0.06 ng/l methylmercury in their effluent.

By [seven years after the effective date of this amendment], every facility that discharges to the Delta or Yolo Bypass (Table B) that discharges above its methylmercury allocation – including those that were not required to conduct **Characterization and Control Studies** – shall submit a management plan that identifies its preferred control options to achieve its methylmercury allocation and a time schedule for implementation. If a discharger indicates achieving the on-site allocation is infeasible, the discharger shall provide a management plan for partial compliance and detailed information documenting why achieving the allocations on-site is infeasible.

New NPDES facilities that discharge or propose to discharge methylmercury to the Delta or its upstream tributaries downstream of major dams during Phase 1 shall conduct the Characterization and Control Studies if their annual average effluent methylmercury exceeds 0.06 ng/l.

Total Mercury. NPDES facilities that discharge greater than 1 mgd to the Delta or its tributaries downstream of major dams (Table C) shall (a) monitor their effluent for total mercury, (b) implement a Mercury Evaluation and Minimization Program, and (c) maintain compliance with a USEPA approved pretreatment program, as applicable. The Regional Water Board may require facilities not listed in Table C to monitor and control total mercury based on facility- and receiving water-specific conditions.

Beginning in [three months after the effective date of this amendment], facilities listed in Table C shall monitor effluent total mercury concentrations monthly for one year, calculate the average annual concentration of total mercury in effluent, and submit a monitoring report to the Regional Water Board. This annual average effluent total mercury concentration shall be the baseline for evaluating the effectiveness of the Mercury Evaluation and Minimization Program during subsequent years. After one year of monitoring, facilities may modify their monitoring frequency with approval of the Executive Officer.

The facilities listed in Table C shall submit a mercury evaluation and minimization plan to the Regional Water Board by [two years after the effective date of this amendment] for approval by the Executive Officer. The mercury evaluation and minimization plan shall be designed to (a) maintain the annual average effluent total mercury concentration at or below the

baseline concentration and (b) minimize effluent total mercury loading to the maximum extent practicable. The mercury evaluation and minimization plan shall include:

1. A description of the discharger's existing mercury control efforts and baseline annual average effluent total mercury concentration and load;
2. A description of all mercury sources contributing, or potentially contributing, to the mercury loading in the facility influent;
3. An analysis of potential pollution prevention and control actions that could reduce effluent total mercury concentrations and/or loads;
4. A description of the tasks, cost, and time required to implement actions to control effluent total mercury concentration and load;
5. A monitoring program for determining the results of the pollution prevention and control actions; and
6. An analysis of the benefits and any potential adverse environmental impacts, including cross-media impacts or substitute chemicals, that may result from the implementation of the mercury minimization plan.

Annually, the dischargers shall report to the Regional Water Board all mercury monitoring results; a summary of all actions undertaken during the previous year pursuant to the minimization plan; and a description of actions to be taken in the following year. The report shall compare the annual average concentration for the past calendar year (January through December) to the baseline concentration. If the annual average concentration is greater than baseline, the discharger shall conduct additional monitoring, evaluate the increase, and develop and implement changes to the mercury minimization plan to correct any concentration increase. If the annual average concentration is greater than the baseline concentration due to implementation of a water conservation program in a WWTP's service area or additional reclamation by a WWTP, the discharger may request from the Executive Officer a variance from maintaining the baseline concentration.

NPDES permits for new discharges or facilities shall require mercury control based on best practicable treatment and control.

Chapter V contains total mercury monitoring and annual average concentration calculation specifications.

Urban Runoff

Methylmercury. The methylmercury wasteload allocations listed in Table D apply to runoff from urban areas within Municipal Separate Storm Sewer System (MS4) service areas within the Delta and Yolo Bypass. The allocations for each subarea apply to the sum of annual methylmercury loads discharged by MS4 urban areas in each subarea. The methylmercury allocations shall be achieved no later than 2030.

After [four years after the effective date of this Basin Plan amendment], Phase 1 methylmercury concentration limits apply to the following MS4s: Sacramento MS4 (CAS082597), Stockton MS4 (CAS083470), and Tracy MS4 (CAS000004). The Phase 1 limits apply to the entire MS4 service area, including those portions outside the legal Delta boundary. The MS4s shall maintain the Phase 1 limits throughout the duration of Phase 1. The MS4s also shall maintain the Phase 1 limits in Phase 2 until the MS4s achieve their

methylmercury wasteload allocations for service areas within the Delta and Yolo Bypass and any Phase 2 effluent limits established for MS4 areas upstream of the Delta.

Phase 1 methylmercury concentration limits specific to each of the Sacramento, Stockton, and Tracy MS4s shall be the 90th percentile methylmercury concentration of water samples collected during 2000 to 2010. The 2000-2010 monitoring period that defines the MS4-specific methylmercury concentration limits may be extended to ensure the inclusion of a range of wet and dry years and storm intensities, as approved by the Executive Officer. By [three months after the effective date of this amendment], the MS4s with methylmercury concentration limits shall begin monitoring methylmercury and total mercury at their compliance points and include their monitoring results in their annual Self-Monitoring Reports to the Regional Water Board. Chapter V contains methylmercury monitoring and compliance specifications.

During Phase 1, the following MS4 areas shall complete **Characterization and Control Studies:** Sacramento MS4 (CAS082597), Stockton MS4 (CAS083470), and Tracy MS4 (CAS000004). The study requirement applies to the entire MS4 service area, including those portions outside the legal Delta boundary. The studies shall characterize methyl and total mercury concentrations and loads in MS4 discharges and receiving waters and identify a suite of best management practices that can be implemented to achieve methylmercury allocations and control methyl and total mercury discharges.

The MS4 urban runoff methylmercury allocations implicitly include all current and future MS4 urban discharges not otherwise addressed by another methylmercury allocation within the geographic boundaries of urban runoff management agencies, including but not limited to Caltrans roadway and non-roadway facilities and rights-of-way, public facilities, properties proximate to banks of waterways, industrial facilities, and construction sites.

MS4s that are designated after the effective date of this amendment may necessitate adjustments to the methylmercury allocations. Urban areas in the Delta and Yolo Bypass (including industrial and construction discharges) that are not regulated by MS4s shall maintain their existing methylmercury discharges (0.85 g/year).

Total Mercury. Erosion and sediment control is expected to reduce mercury discharges in urban runoff. During Phase 1, dischargers listed in Table E shall implement best management practices to the maximum extent practicable to control erosion and sediment discharges.

The Sacramento MS4 (CAS082597), Stockton MS4 (CAS083470), and Tracy MS4 (CAS000004) permittees shall implement pollution prevention measures and best management practices to the maximum extent practicable to minimize total mercury discharges. These MS4s shall submit a mercury plan by [one year after the effective date of this Basin Plan amendment] for Executive Officer approval. The mercury plan shall include a description of the discharger's existing mercury control efforts, a description of all mercury sources contributing, or potentially contributing, to the mercury loading in MS4 discharges, and an analysis of potential prevention and control actions that could minimize mercury loading.

Flood Conveyance Flows,
Water Management and Storage, and Dredging

Methylmercury flux from sediment in open waters of the Delta needs to be reduced. At a minimum, methylmercury flux should not increase above the levels defined in Table F. Changes in flood conveyance, water management activities, and seasonal wetland flooding may influence ambient methylmercury loads and concentrations in the Delta. Additionally, changes in the salinity concentrations of Delta waters (with the resulting changes in sulfate concentrations) may also influence the ambient methylmercury loads and concentrations in the Delta.

Proponents for new projects that have the potential to increase ambient methylmercury and/or total mercury concentrations or loads in the Delta shall conduct **Characterization and Control Studies** to determine baseline conditions, evaluate potential negative impacts of project alternatives on ambient mercury and/or methylmercury levels, and develop mitigation measures for alternatives that would increase ambient mercury and/or methylmercury levels.

Flood Conveyance and Associated Seasonal Wetland Flooding. Agencies responsible for flood conveyance activities in the Yolo Bypass include Department of Water Resources (DWR) and U.S. Bureau of Reclamation (USBR).

The Regional Water Board requires responsible agencies that propose new flood conveyance projects or changes to existing flood conveyance projects complete **Characterization and Control Studies** prior to project completion. Changes in flood conveyance include new or modified weirs in the Yolo Bypass and changes in the *Central Valley Project – Operations Criteria and Plan, 30 June 2004* (CVP-OCAP) that result in increased flows, flood frequency, or flood duration in the Yolo Bypass. If a characterization study indicates a project would increase ambient methylmercury and/or total mercury levels, then the project proponents shall develop and implement control actions to minimize any potential increase.

The responsible parties should coordinate with wetland and agricultural landowners to characterize existing methylmercury discharges to open waters from lands immersed by managed flood flows and develop methylmercury control measures.

Water Management. Existing water management activities in the Delta include upstream reservoir storage and releases, water routing, and state and federal water diversion projects. Agencies responsible for water management activities in the Delta include DWR and USBR.

Proponents of new or expanded reservoirs, changes to the CVP-OCAP that result in alterations to currently permitted water storage or release schedules, or new within-Delta diversion projects (including the South Delta Improvement Project and “Delta Wetlands Project”), shall evaluate the potential of the projects to increase methylmercury and/or total mercury levels in the Delta prior to project completion. If the evaluation indicates a project would increase ambient methylmercury and/or total mercury levels, then the project proponents shall develop control actions, evaluate the affects of potential control actions on other water quality or flow mandates (e.g., minimum flow and temperature mandates) for such projects, and implement those control actions that do not conflict with the other water quality or flow mandates.

Salinity Objectives. The Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin River Estuary (Bay-Delta Plan) includes Water Quality Objectives for salinity (typically measured as electrical conductivity) at specific locations in the Delta. An example of this is the Delta Outflow objective, which requires the maintenance of the two parts per thousand salinity level (X2) at various locations within the Delta, depending on the season and water year type. Changes to the water quality objectives for salinity (such as the Delta Outflow objective) or flow management practices used to maintain current salinity objectives could affect sulfate concentrations in sediment and methylmercury production rates.

Proponents of water management actions that could result in direct or indirect changes to sulfate concentrations in the Delta due to changes to the salinity objectives shall conduct studies to characterize baseline methylmercury production in open channels during different seasons and flow regimes prior to project completion. In addition, project proponents shall:

1. Evaluate direct and indirect effects of proposed flow management practices on sulfate concentrations and methylmercury production in the Delta; and
2. Conduct sulfate amendment studies to determine whether sulfate concentrations affect methylmercury production rates and resulting ambient water column concentrations in the Delta.

If changes in the salinity objectives (or changes in flow management practices used to maintain current salinity objectives) would increase ambient methylmercury levels, then the project proponents shall 1) develop methylmercury control actions, 2) evaluate potential conflicts between methylmercury control actions and mandates for achieving salinity objectives, 3) document the inability to implement feasible methylmercury control actions if there is a conflict with meeting salinity objectives, and 4) implement those methylmercury control actions that do not conflict with the mandates. Project proponents shall report their methylmercury control plans prior to project completion.

Dredging. The following requirements apply to dredge projects in the Delta where a Clean Water Act 401 Water Quality Certification is required. The Clean Water Act 401 Water Quality Certifications shall include the following conditions:

1. Dredging activities and activities that reuse dredge material in the Delta shall minimize increases in methyl and total mercury loads to Delta waterways (Appendix 43).
2. Conduct pre-dredge sediment coring to determine total mercury concentrations of surface sediment and buried sediment at the proposed dredge depth as required by the Executive Officer. During Phase 1, if the sediment to be exposed by the project has an average total mercury concentration greater than the surface material before dredging, the project proponent shall submit a work plan for Executive Officer approval that demonstrates that the project will be accomplished in a manner that minimizes the increase in the amount of mercury or methylmercury fluxing from the newly exposed sediment.
3. Employ management practices during and after dredging activities as required by Regional Water Board staff to minimize sediment releases into the water column.
4. Characterize total mercury load and concentration of material removed from Delta waterways (Appendix 43) by dredging activities.

5. When approved dredge material disposal sites are utilized to settle out solids and return waters are discharged into the adjacent surface water, ensure that return flows do not have methylmercury concentrations greater than the receiving water concentration.
6. Ensure that dredged material reused at upland sites, including the tops and backs of levees, is protected from erosion.
7. Ensure that reuse of dredge material at aquatic locations, such as wetland and riparian habitat restoration sites, does not result in a net increase in methylmercury discharges from the sites. Projects that propose to dispose dredge material to aquatic sites shall conduct monitoring to demonstrate that their activities are accomplished in a manner that does not increase the bioavailability of mercury.

Cache Creek Settling Basin

The Cache Creek Settling Basin is effective at reducing total mercury loads to the Yolo Bypass; however, it is also a source of methylmercury. Table G identifies the methylmercury allocation for the Cache Creek Settling Basin. For Phase 1, the Reclamation Board and DWR (agencies responsible for the basin operations and maintenance) shall:

1. Complete **Characterization and Control Studies** to characterize methyl and total mercury concentrations and loads in import and export waters during varying flow regimes, and to identify a suite of methylmercury control options; and
2. Select preferred control options to achieve the methylmercury allocation and a time schedule to meet the allocation by 2030. The methylmercury control actions can be part of the required total mercury reductions described below.

If the responsible agencies determine that achieving the methylmercury allocation through within-basin management practices is infeasible, they shall submit a management plan and implementation schedule to achieve partial compliance and detailed information documenting why achieving the full allocation on-site is infeasible.

Improvements to the Cache Creek Settling Basin. The Delta Mercury Control Program requires a total mercury reduction of 45 kg/yr from the Cache Creek Settling Basin exports in addition to mercury reduction efforts described in the Cache Creek Watershed Program. Improvements to the Settling Basin to increase its sediment retention efficiency and ongoing sediment removal to maintain the life of the basin will reduce total mercury discharged from the basin.

- By [one year after the effective date of this amendment], DWR shall develop a strategy to improve the sediment retention efficiency and to provide long-term maintenance of the Settling Basin. The strategy shall address potential basin improvements, sediment removal, implementation schedules, and funding options.
- By [two years after the effective date of this amendment], DWR shall work with the landowners within the Settling Basin and develop a plan and schedule for sediment removal.
- By [three years after the effective date of this amendment], DWR shall submit a detailed plan for improvements to the basin to increase its sediment and mercury mass trapping efficiency to 75%.

- By [five years after the effective date of this amendment], DWR shall initiate control actions to reduce total mercury loads from the Cache Creek Settling Basin and complete project improvements by [seven years after the effective date of this amendment].

DWR shall submit the strategy and planning documents described above to the Regional Water Board for approval by the Executive Officer.

Tributary Watersheds

Table G identifies methylmercury allocations for tributary inputs to the Delta.

The sum total of 20-year average total mercury loads from the American River, Putah Creek, and Feather River needs to be reduced by 32 kg/yr, from 103 to 71 kg/yr. Future mercury control programs for these watersheds will implement this reduction. Additional total mercury load reductions may be required to accomplish future water quality objectives to be established for those watersheds.

Pilot Mercury Offset Projects and Early Implementation of Total Mercury Reduction Efforts

By [8 years after the effective date of this amendment], the Regional Water Board intends to consider adoption of an offset program to allow dischargers to offset methylmercury and/or total mercury in their discharges by implementing more feasible or cost effective projects elsewhere in the watershed. The offset program will be consistent with any State Water Board offset policy that is developed. In the interim, the Regional Water Board will allow all mercury and/or methylmercury dischargers to conduct pilot offset projects. The pilot offset projects could achieve one or more of several goals: accomplish early implementation of mercury and methylmercury reduction projects; provide information that can be used to develop the offset program in Phase 2; and/or earn credit to offset methylmercury allocation requirements during Phase 2.

The Regional Water Board will use the following to evaluate proposed pilot projects:

1. Proposed projects will be evaluated and credits calculated based on estimates of mercury and/or methylmercury load reductions achieved on an annual basis in the Delta or Yolo Bypass.
2. During the Phase 1 pilot program, the baseline for purposes of calculating and generating offset credits is defined by the conditions existing as of 2005.
3. In cases where the site for the pilot project has a methylmercury allocation and the owner of the site intends to keep a portion of the credits generated from the offset demonstration project, the partners in the project must document how credit for the project will be apportioned.
4. The implementation of pilot offset projects must not result in changes to the total of the methylmercury allocations that are applicable in the Delta.
5. The Regional Water Board preference is that pilot offset projects occur within the same watershed as the offset proponent's discharge; however, the Regional Water Board will consider approving pilot projects in an adjacent watershed, when it can be demonstrated that the offset project will provide significant Delta-wide benefits. In this case, load and

wasteload allocations for all sources would need to be adjusted within the discharger's watershed to account for environmental impacts at the discharger's point of discharge.

6. To be most useful, the pilot offset projects should focus on projects that can be implemented relatively quickly. The Regional Water Board preference is that pilot offset projects result in long-term (at least 20 years) annual load reductions. However, the Regional Water Board may consider approving a pilot offset project that is not expected to result in long-term annual load reductions if the project would result in substantial short-term improvements.
7. Mercury and methylmercury reductions from the following sources would be acceptable for offset projects: mercury and gold mine sites, Cache Creek Settling Basin, in-stream contaminated sediments, NPDES facility and MS4 discharges, wetlands, irrigated agriculture, flood conveyance and water management activities, or other Regional Water Board approved projects.

The following requirements apply to offset pilot projects:

1. Dischargers that implement approved pilot total mercury and methylmercury offset projects to accumulate credits may use the credits to extend time schedules for compliance with methylmercury wasteload allocations by up to five years, but shall not use the credits to extend schedules beyond 2035.
2. Any discharger proposing a pilot offset project shall conduct the **Characterization and Control Studies** to determine the feasibility of on-site controls for its own methylmercury discharges.
3. Pilot offset proposals must be submitted to the Regional Water Board by [4 years after the effective date of this amendment].
4. Pilot offset proposals shall evaluate mercury/methylmercury transformations in the environment at the location of the offset project, and shall include an appropriate offset ratio and safety factor to account for the location and uncertainties of the benefits of the offset project versus the environmental impact of the effluent discharge.
5. Any proposed project shall be subject to scientific peer review under the State Water Board's external scientific peer review process developed to comply with Health and Safety Code section 57004. Following peer review, staff shall circulate the proposal for public review and comment and then shall present the proposal for consideration for approval by resolution of the Regional Water Board.
6. The period for offset credit accumulation shall not exceed 10 years following Regional Water Board approval of the pilot offset project. At any time, the Regional Water Board may review the project and consider a time extension.
7. The pilot offset project proponent shall submit documentation of the estimated mercury and/or methylmercury load reductions achieved at the project site as well as reductions expected to be achieved in the Delta or Yolo Bypass, or other receiving water.
8. Credits accumulated by an offset project shall not be tradable to any other party.

In addition to accumulating offset credits by implementing Regional Water Board approved mercury offset projects, the Regional Water Board will consider approving credit for dischargers that can demonstrate that they have implemented mercury control programs and can document measurable improvements in their effluent quality with regards to the discharge of total mercury and methylmercury between 2000 and [the effective date of this

amendment]. Methylmercury and total mercury credits accrued as a result of effluent quality improvements and credits accrued as a result of any pilot offset project that is implemented may be used to extend the time schedules for compliance with methylmercury allocations by five years, but shall not use the credits to extend schedules beyond 2035. This provision does not affect any other provisions of the Delta Mercury Control Program.

The Sacramento Regional County Sanitation District (SRCSD) has been evaluating mercury reduction projects to improve the understanding of how offset projects may be used to effectively achieve the goals of mercury reduction in the Sacramento-San Joaquin Delta by offsetting mercury and methylmercury in discharges from the SRCSD Wastewater Treatment Plant to the Sacramento River. SRCSD evaluated offset projects at mercury mines, Sulphur Creek, and the Cache Creek Settling Basin, and worked with a large stakeholder group to evaluate the technical and legal issues of these projects. SRCSD plans to propose a pilot offset project that will follow the requirements included in this section and the project will be brought back to the Regional Water Board for consideration.

In addition, SRCSD has implemented mercury control programs and documented significant improvements in effluent quality from the Sacramento River WWTP for mercury and methylmercury discharges since 2003. The Regional Water Board recognizes these efforts and grants credits for these activities in accordance with the following:

1. Regional Water Board Order No. 5-00-188 (NPDES Permit No. CA 0077682) established a maximum annual mass discharge limitation of total mercury to the Sacramento River, and allowed the accumulation of credits and debits for total mercury discharges below and above the annual mass limitation. Any net mass credit of total mercury accumulated under Order No. 5-00-188 and subsequent revisions to this NPDES permit, and the equivalent mass credit of methylmercury (100 grams of methylmercury per kilogram of total mercury, the average methylmercury to mercury ratio in effluent) shall be available to offset methylmercury allocations up to the extent sufficient credit has accumulated.

2. Methylmercury and total mercury credits accrued as a result of effluent quality improvements and credits accrued as a result of any pilot offset project that is implemented may be used to extend the time schedule for compliance with the methylmercury wasteload allocation for the Sacramento River WWTP by up to five years, and shall not be used to extend its compliance schedule beyond 2035.

3. These provisions do not affect any other provisions of the Delta Mercury Control Program.

4. Accrual of mercury and methylmercury credits accumulated under Order No. 5-00-188 and subsequent revisions to this NPDES permit shall cease after [the effective date of this amendment].

Risk Management Program

Until methylmercury and mercury reductions are reflected in attainment of the fish tissue objectives, activities need to be undertaken to reduce methylmercury exposure to people who eat Delta fish. Methylmercury dischargers in the Delta and Yolo Bypass shall develop and implement effective programs to reduce mercury related risks and quantify risk reductions resulting from the risk reduction activities. These requirements apply to:

- Specific wastewater facilities listed on Table C (see footnote (c));
- Urban storm water agencies: Sacramento Area MS4 (CAS082597), Stockton Area MS4 (CAS083470), and Tracy MS4 (CAS000004); and
- Any agencies proposing new wetland projects in the Delta or Yolo Bypass that have the potential to discharge methylmercury.

The dischargers should work with affected communities and the public health agencies to develop and implement the program. Dischargers may work together to develop a comprehensive risk management program(s). The risk management program(s) should include the following activities:

- Provide multilingual fish-consumption advice to the public to help reduce methylmercury exposure through community outreach, broadcast and print media, and signs posted at popular fishing locations;
- Regularly inform the public about monitoring data and findings regarding hazards of eating mercury-contaminated fish;
- Perform special studies needed to support health risk assessment and risk communication; and
- Investigate ways and propose plans to address public health impacts of mercury in Delta fish, including activities that reduce the actual and potential exposure of and mitigate health impacts to those people and communities most likely to be affected by mercury in Delta fish, such as subsistence fishers and their families.

The methylmercury dischargers shall submit a risk management workplan for Executive Officer approval by [two years after the effective date of this amendment], and implement the plan by [four years after the effective date of this amendment]. Every three years thereafter, the dischargers shall provide a progress report to the Regional Water Board.

Monitoring and Review

The monitoring guidance for the Delta is described in Chapter V, Surveillance, and Monitoring.

Exceptions for Low Threat Discharges

Discharges subject to a waiver of waste discharge requirements based on a finding that the discharges pose a low threat to water quality, except for discharges subject to water quality certifications, are exempt from the mercury requirements of this Delta Mercury Control Program.

Discharges subject to waste discharge requirements for dewatering and other low threat discharges to surface waters are exempt from the mercury requirements of this Delta Mercury Control Program.

Recommendations for Other Agencies

For development projects requiring Clean Water Act Section 404 permits that involve compensatory and/or mitigation wetlands, the USACE, USFWS, NOAA Fisheries, and

CDFG should ensure that replacement wetland projects adopt methylmercury controls consistent with the wetland requirements of this Delta Mercury Control Program.

The Central Valley and San Francisco Water Boards should consider conducting coordinated studies to evaluate methyl and total mercury loads that flux between the jurisdictional areas to adjust allocations as necessary.

Existing methylmercury and total mercury inputs from atmospheric wet deposition should be maintained at existing loading rates (23 g/yr methylmercury and 2.3 kg/yr total mercury). USEPA, the State Water Board, and the Air Resources Board should develop a memorandum of understanding to conduct studies to evaluate local and statewide mercury air emissions and deposition patterns and to develop options for a load reduction program(s).

The State Water Board should consider requiring methylmercury controls for new water management activities that are found to increase ambient methylmercury levels as a condition of approval of any water right action required to implement the project. The State Water Board Division of Water Rights should consider requiring the evaluation and implementation of feasible management practices to reduce or, at a minimum, prevent methylmercury ambient levels from increasing from changes to flood conveyance projects. The State Water Board should consider funding or conducting studies to develop and evaluate management practices to reduce methylmercury production resulting from existing water management activities or flood conveyance projects.

During future reviews of the salinity objectives contained in the Bay-Delta Plan, the State Water Board Division of Water Rights should consider conducting studies to determine if methylmercury production in the Bay-Delta is a function of sulfate concentrations. Furthermore, the State Water Board should consider the results of these studies in evaluating changes to the salinity objectives.

If funding is available, the Regional Water Board will conduct studies to evaluate the effects of water management, flood conveyance and salinity control projects on ambient methylmercury levels in the Delta.

The California Office of Environmental Health Hazard Assessment should update and expand the list of fish advisories for the Delta. In addition, the California Department of Health Services and the local county health departments should develop and promote public education programs and work with at-risk fish consumers to develop risk management activities.

Revise Chapter IV (Implementation), under "Estimated Costs of Agricultural Water Quality Control Programs and Potential Sources of Financing" to add:

Delta Mercury Control Program

The total estimated costs (2007 dollars) for the agricultural methylmercury characterization and control studies to develop management practices to meet the Delta methylmercury objectives range from $430,000 to $820,000. The estimated annual costs for agricultural discharger compliance monitoring range from$14,000 to $25,000.

The estimated annual costs for Phase 2 implementation of methylmercury management practices range from $500,000 to $1.1 million.

Potential funding sources include:

1. Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

Revise Chapter V (Surveillance and Monitoring) to add:

Delta

Fish methylmercury compliance monitoring. The Regional Water Board will use the following specifications to determine compliance with the methylmercury fish tissue objectives in the Sacramento-San Joaquin Delta. Regional Water Board staff will initiate fish tissue monitoring five years after dischargers implement projects to reduce methylmercury and total mercury discharges. Compliance monitoring will ensue every ten years thereafter. Initial fish tissue monitoring will take place at the following compliance reaches in each subarea:

- Central Delta subarea: Middle River between Bullfrog Landing and Mildred Island;
- Marsh Creek subarea: Marsh Creek from Highway 4 to Cypress Road;
- Mokelumne/Cosumnes River subarea: Mokelumne River from the Interstate 5 bridge to New Hope Landing;
- Sacramento River subarea: Sacramento River from River Mile 40 to River Mile 44;
- San Joaquin River subarea: San Joaquin River from Vernalis to the Highway 120 bridge;
- West Delta subarea: Sacramento/San Joaquin River confluence near Sherman Island;
- Yolo Bypass-North subarea: Tule Canal downstream of its confluence with Cache Creek; and
- Yolo Bypass-South subarea: Toe Drain between Lisbon and Little Holland Tract.

Once fish tissue methylmercury concentrations at a given subarea's compliance reach have achieved the methylmercury fish tissue objectives, fish tissue monitoring will take place at additional waterways in the subarea to ensure that the objectives are achieved throughout the subarea. Priority for additional fish sampling should be given to sites where fishing is popular.

Compliance fish methylmercury monitoring will include representative fish species for comparison to each of the methylmercury fish tissue objectives:

- Trophic Level 4: bass (largemouth and striped), channel and white catfish, crappie, and Sacramento pikeminnow.

- Trophic Level 3: American shad, black bullhead, bluegill, carp, Chinook salmon, redear sunfish, Sacramento blackfish, Sacramento sucker, and white sturgeon.
- Small (<50 mm) fish: primary prey species consumed by wildlife in the Delta, which may include the species listed above, as well as inland silverside, juvenile bluegill, mosquitofish, red shiner, threadfin shad, or other fish less than 50 mm.

Trophic level 3 and 4 fish sample sets will include three species from each trophic level and will include both anadromous and non-anadromous fish. Trophic level 3 and 4 fish sample sets will include a range of fish sizes between 150 and 500 mm total length. Striped bass, largemouth bass, and sturgeon caught for mercury analysis will be within the CDFG legal catch size limits. Sample sets for fish less than 50 mm will include at least two fish species that are the primary prey species consumed by wildlife at sensitive life stages. In any subarea, if multiple species for a particular trophic level are not available, one species in the sample set is acceptable.

Regional Water Board staff will work with the State Water Board and dischargers to develop a strategy to fund the fish tissue monitoring program.

Water Methylmercury and Total Mercury Compliance Monitoring. Unfiltered methylmercury samples shall be analyzed, at a minimum, with a method detection limit (MDL) of 0.02 ng/l and minimum reporting level (ML) of 0.05 ng/l. Unfiltered total mercury samples shall be analyzed, at a minimum, with a MDL of 0.2 ng/l and ML of 0.5 ng/l. Minimum reporting levels are equivalent to the lowest calibration standards for methylmercury and total mercury, 0.05 and 0.5 ng/l at a minimum, respectively. For measurements between the ML and MDL, one half the ML shall be used in average and 90th percentile concentration and load calculations. For measurements less than the MDL, one half the MDL shall be used in average and 90th percentile concentration and load calculations. Alternate statistical methods of addressing measurements less than the ML or MDL may be utilized with Executive Officer approval.

The methylmercury goal of 0.06 ng/l for ambient Delta water is the annual, average concentration in unfiltered samples. For comparison of Delta waterways (Appendix 43) and tributary methylmercury concentration data with the methylmercury goal, water samples should be collected periodically throughout the year and during typical flow conditions as they vary by season, rather than targeting extreme low or high flow events. Ambient water monitoring should take place at the same locations as the fish methylmercury compliance monitoring as well as at the tributary inputs listed in Table G. Ambient water monitoring should take place for at least one year before the fish monitoring takes place. Methylmercury monitoring data may be collected by the Regional Water Board or required of project proponents.

Compliance points for irrigated agriculture and managed wetlands methylmercury allocations shall be developed during the Phase 1 methylmercury **Characterization and Control Studies**.

NPDES facilities' compliance points for methylmercury and total mercury monitoring are the effluent monitoring points currently described in individual NPDES permits. Facilities listed in Tables B and C that discharge greater than one million gallons per day (1 mgd) shall conduct monitoring once per month, at a minimum; facilities that discharge less than 1 mgd shall conduct quarterly monitoring, at a minimum. Heating/cooling and power facilities shall

conduct concurrent monitoring of their intake water and effluent discharge. All facilities listed in Tables B and C shall monitor methylmercury. Facilities required to implement total mercury evaluation and minimization programs (Table C) also shall monitor total mercury. Facilities that begin discharging to surface water during Phase 1, and facilities for which effluent methylmercury data were not available at the time Table C was compiled, shall conduct monitoring and have Phase 1 methylmercury concentration limits and baseline total mercury concentrations set equal to the annual average effluent methylmercury and total mercury concentrations, respectively, calculated from their first 12 months of monitoring. Annual average (January-December) total mercury and methylmercury concentrations for each year shall be the average of monthly averages. Monthly averages are the mean of all concentration data collected during a given month.

Compliance points and monitoring frequency for MS4s required to conduct methylmercury and total mercury monitoring are those locations and wet and dry weather sampling periods currently described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis. After the establishment of an MS4-specific methylmercury concentration limit (90^{th} percentile concentration of all sample results collected by an MS4 during the 2000-2010 monitoring period), compliance during the following years shall be evaluated by comparing the 95% confidence interval for the mean of the methylmercury concentration data collected by the MS4 during a given year to the limit.

Annual methylmercury loads in urban runoff in MS4 service areas may be calculated by the following method or by an alternate method approved by the Executive Officer. The annual methylmercury load in urban runoff for a given MS4 service area during a given year may be calculated by the sum of wet weather and dry weather methylmercury loads. To estimate wet weather methylmercury loads discharged by MS4 urban areas, the average of wet weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the wet weather runoff volume estimated for all urban areas within the MS4 service area. To estimate dry weather methylmercury loads, the average of dry weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the estimated dry weather urban runoff volume in the MS4 service area.

Add New Appendix 43 as follows:

APPENDIX 43
Delta and Yolo Bypass Waterways Applicable to the Delta Mercury Control Program

Table A43-1 lists the Sacramento-San Joaquin Delta waterways and the Yolo Bypass waterways within the Delta and north of the legal Delta boundary to which the site-specific methylmercury fish tissue objectives and implementation program and monitoring provisions apply. The list contains distinct, readily identifiable water bodies within the boundaries of the "Legal" Delta (as defined in California Water Code section 12220) that are hydrologically connected by surface water flows (not including pumping) to the Sacramento and/or San Joaquin rivers. The list also includes Knights Landing Ridge Cut, Putah Creek, and Tule Canal in the Yolo Bypass north of the legal Delta boundary. Figures A43-1, A43-2, and A43-3 show the locations of these waterways.

The methylmercury allocations set forth in the Delta methylmercury control program are specific to Delta subareas, which are shown on Figure A43-4. Table A43-2 lists the waterways within each of the subareas.

TABLE A43-1: DELTA AND YOLO BYPASS WATERWAYS

Map Label # / Waterway Name	Map Label # / Waterway Name
1. Alamo Creek	48. Grizzly Slough
2. Babel Slough	49. Haas Slough
3. Barker Slough	50. Hastings Cut
4. Bear Creek	51. Hog Slough
5. Bear Slough	52. Holland Cut
6. Beaver Slough	53. Honker Cut
7. Big Break	54. Horseshoe Bend
8. Bishop Cut	55. Indian Slough
9. Black Slough	56. Italian Slough
10. Broad Slough	57. Jackson Slough
11. Brushy Creek	58. Kellogg Creek
12. Burns Cutoff	59. Latham Slough
13. Cabin Slough	60. Liberty Cut
14. Cache Slough	61. Lindsey Slough
15. Calaveras River	62. Little Connection Slough
16. Calhoun Cut	63. Little Franks Tract
17. Clifton Court Forebay	64. Little Mandeville Cut
18. Columbia Cut	65. Little Potato Slough
19. Connection Slough	66. Little Venice Island
20. Cosumnes River	67. Livermore Yacht Club
21. Crocker Cut	68. Lookout Slough
22. Dead Dog Slough	69. Lost Slough
23. Dead Horse Cut	70. Main Canal (Duck Slough tributary)
24. Deer Creek (Tributary to Marsh Creek)	71. Main Canal (Italian Slough tributary)
25. Delta Cross Channel	72. Marsh Creek
26. Disappointment Slough	73. Mayberry Cut
27. Discovery Bay	74. Mayberry Slough
28. Donlon Island	75. Middle River
29. Doughty Cut	76. Mildred Island
30. Dry Creek (Marsh Creek tributary)	77. Miner Slough
31. Dry Creek (Mokelumne River tributary)	78. Mokelumne River
32. Duck Slough	79. Mormon Slough
33. Dutch Slough	80. Morrison Creek
34. Elk Slough	81. Mosher Slough
35. Elkhorn Slough	82. Mountain House Creek
36. Emerson Slough	83. North Canal
37. Empire Cut	84. North Fork Mokelumne River
38. Fabian and Bell Canal	85. North Victoria Canal
39. False River	86. Old River
40. Fisherman's Cut	87. Paradise Cut
41. Fivemile Creek	88. Piper Slough
42. Fivemile Slough	89. Pixley Slough
43. Fourteenmile Slough	90. Potato Slough
44. Franks Tract	91. Prospect Slough
45. French Camp Slough	92. Red Bridge Slough
46. Georgiana Slough	93. Rhode Island
47. Grant Line Canal	94. Rock Slough

TABLE A43-1: DELTA AND YOLO BYPASS WATERWAYS, *Continued*

Map Label # / Waterway Name	Map Label # / Waterway Name
95. Sacramento Deep Water Channel	124. Toe Drain
96. Sacramento River	125. Tom Paine Slough
97. Salmon Slough	126. Tomato Slough
98. San Joaquin River	127. Trapper Slough
99. Sand Creek	128. Turner Cut
100. Sand Mound Slough	129. Ulatis Creek
101. Santa Fe Cut	130. Upland Canal (Sycamore Slough tributary)
102. Sevenmile Slough	
103. Shag Slough	131. Victoria Canal
104. Sheep Slough	132. Walker Slough
105. Sherman Lake	133. Walthall Slough
106. Short Slough	134. Washington Cut
107. Smith Canal	135. Werner Dredger Cut
108. Snodgrass Slough	136. West Canal
109. South Fork Mokelumne River	137. Whiskey Slough
110. Steamboat Slough	138. White Slough
111. Stockton Deep Water Channel	139. Winchester Lake
112. Stone Lakes	140. Woodward Canal
113. Sugar Cut	141. Wright Cut
114. Sutter Slough	142. Yosemite Lake
115. Sweany Creek	143. Yolo Bypass
116. Sycamore Slough	144. Deuel Drain
117. Taylor Slough (Elkhorn Slough tributary)	145. Dredger Cut
	146. Highline Canal
118. Taylor Slough (near Franks Tract)	147. Cache Creek Settling Basin Outflow
119. Telephone Cut	
120. The Big Ditch	148. Knights Landing Ridge Cut
121. The Meadows Slough	149. Putah Creek
122. Three River Reach	150. Tule Canal
123. Threemile Slough	

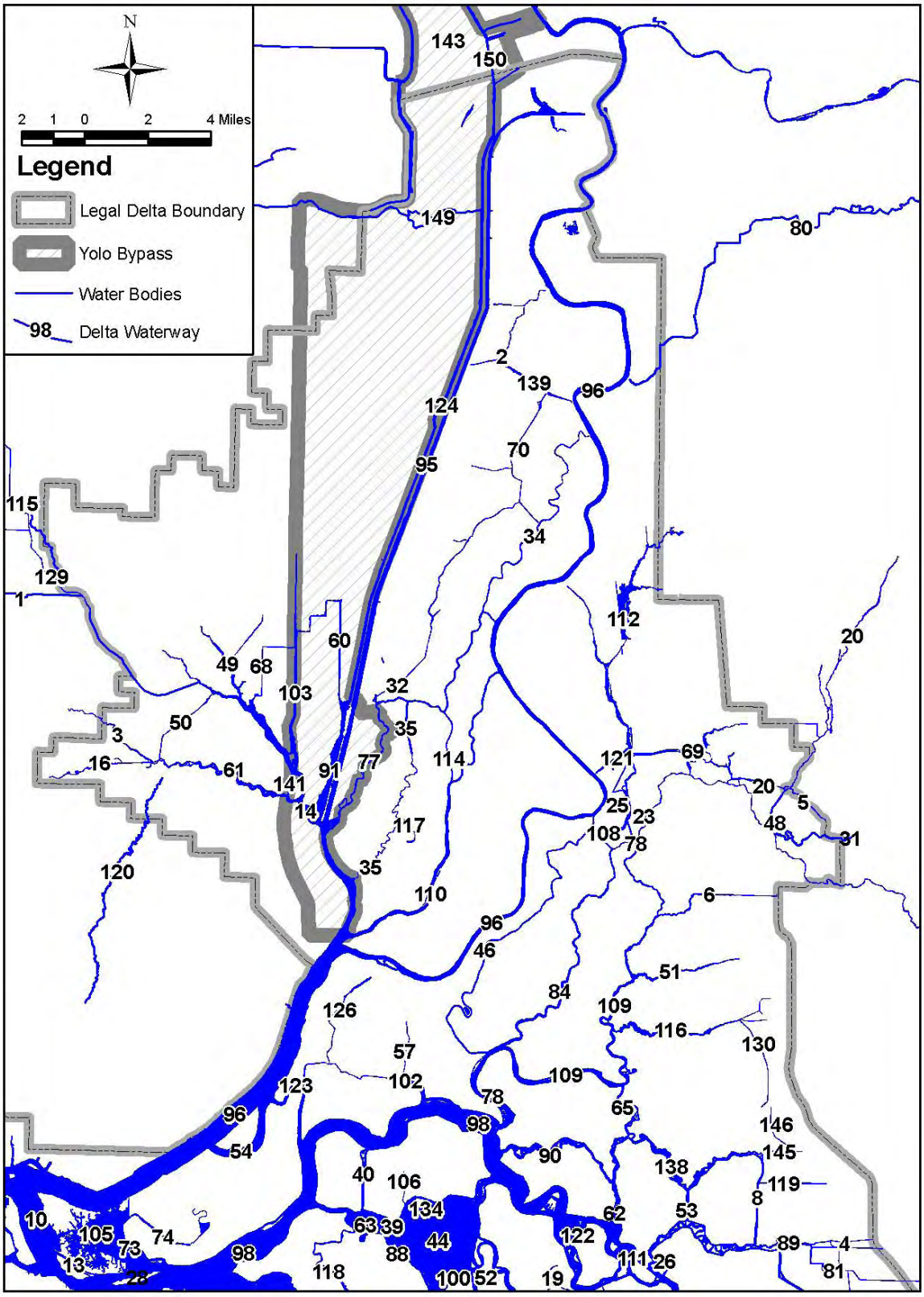

Figure A43-1: Delta Waterways (Northern Panel)

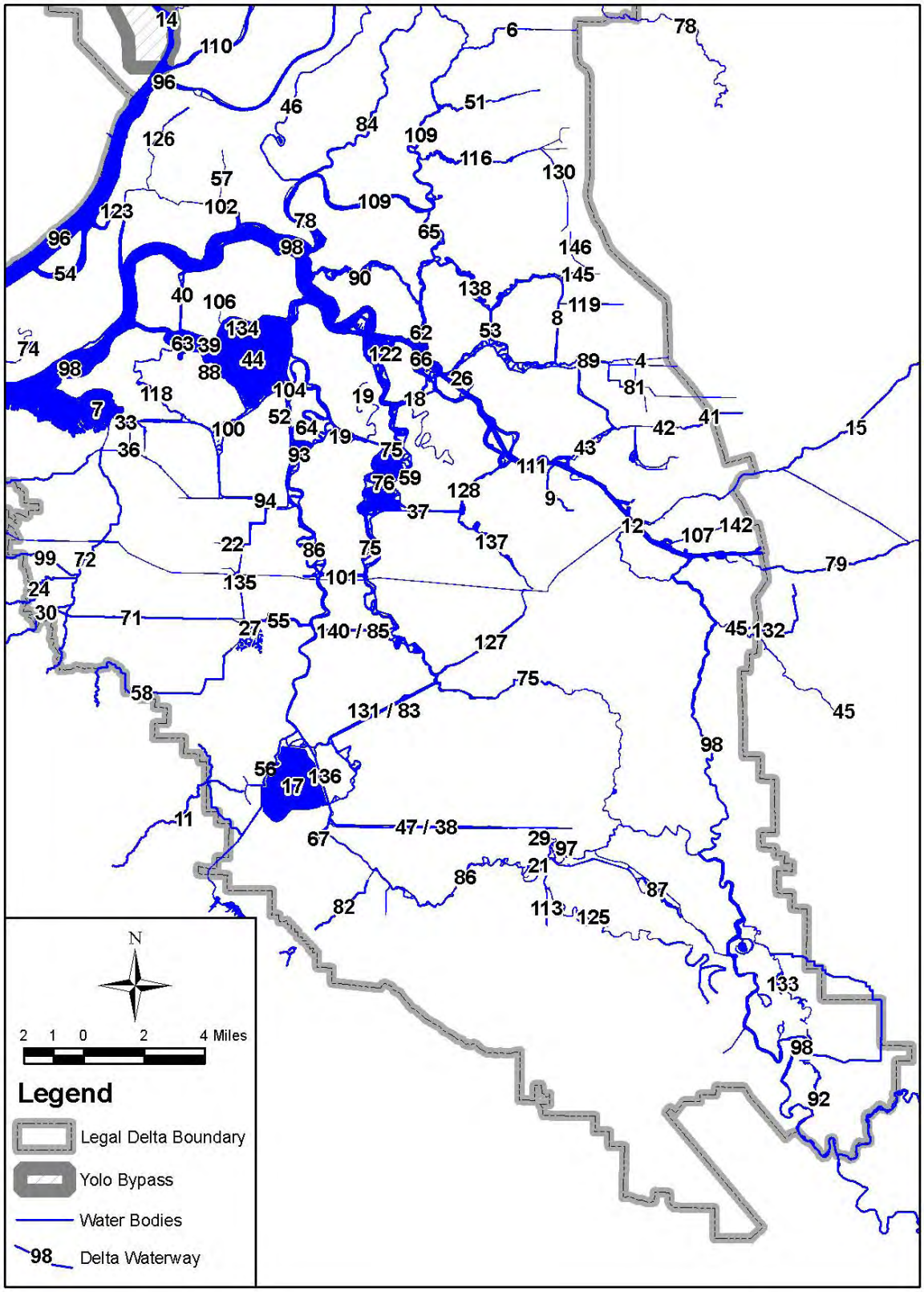

Figure A43-2: Delta Waterways (Southern Panel)

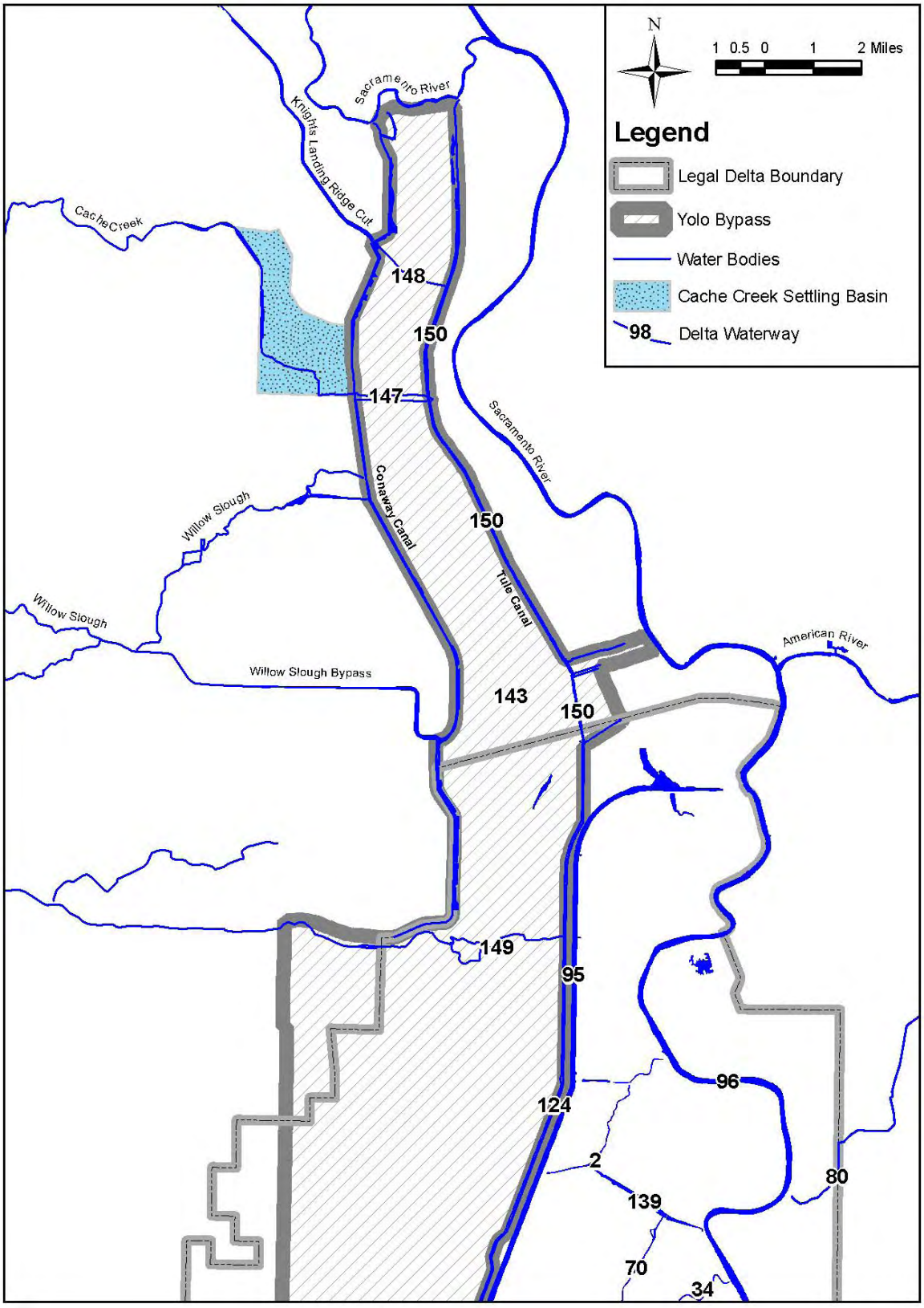

Figure A43-3: Northern Yolo Bypass

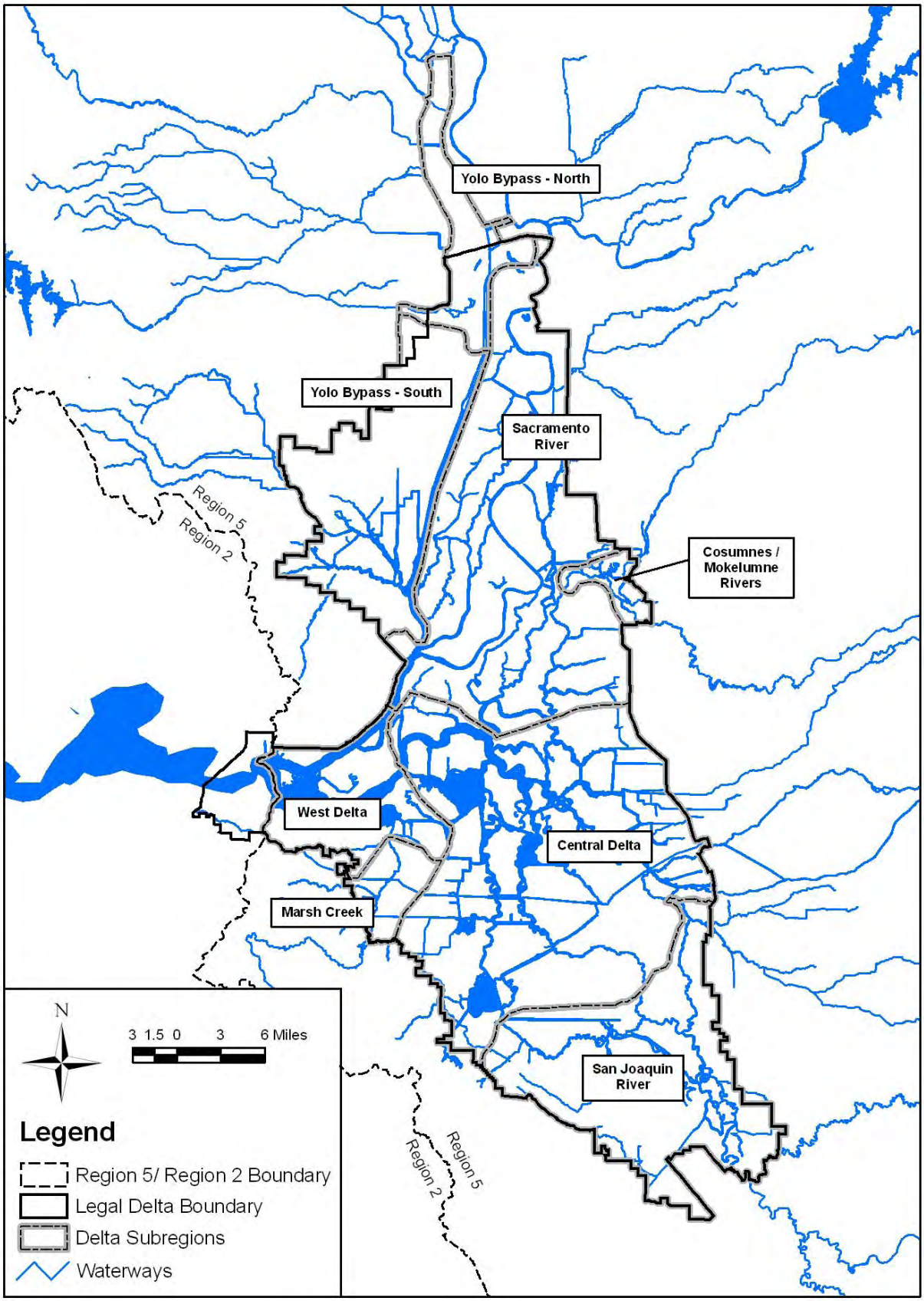

Figure A43-4: Subareas for the Delta Methylmercury Control Program

TABLE A43-2: DELTA AND YOLO BYPASS WATERWAYS BY METHYLMERCURY ALLOCATION SUBAREA

Waterway Name [Map Label #]	Waterway Name [Map Label #]	Waterway Name [Map Label #]
CENTRAL DELTA		
Bear Creek [4]	Indian Slough [55]	San Joaquin River [98]
Bishop Cut [8]	Italian Slough [56]	Sand Mound Slough [100]
Black Slough [9]	Jackson Slough [57]	Santa Fe Cut [101]
Brushy Creek [11]	Kellogg Creek [58]	Sevenmile Slough [102]
Burns Cutoff [12]	Latham Slough [59]	Sheep Slough [104]
Calaveras River [15]	Little Connection Slough [62]	Short Slough [106]
Clifton Court Forebay [17]	Little Franks Tract [63]	Smith Canal [107]
Columbia Cut [18]	Little Mandeville Cut [64]	Stockton Deep Water Channel [111]
Connection Slough [19]	Little Potato Slough [65]	Taylor Slough [nr Franks Tract] [118]
Dead Dog Slough [22]	Little Venice Island [66]	Telephone Cut [119]
Disappointment Slough [26]	Livermore Yacht Club [67]	Three River Reach [122]
Discovery Bay [27]	Main Canal [Indian Slough trib.] [71]	Threemile Slough [123]
Dredger Cut [145]	Middle River [75]	Tomato Slough [126]
Empire Cut [37]	Mildred Island [76]	Trapper Slough [127]
Fabian and Bell Canal [39]	Mokelumne River [78]	Turner Cut [128]
False River [39]	Mormon Slough [79]	Upland Canal [Sycamore Slough tributary] [130]
Fisherman's Cut [40]	Mosher Slough [81]	
Fivemile Creek [41]	North Canal [83]	Victoria Canal [131]
Fivemile Slough [42]	North Victoria Canal [85]	Washington Cut [134]
Fourteenmile Slough [43]	Old River [86]	Werner Dredger Cut [135]
Franks Tract [44]	Piper Slough [88]	West Canal [136]
Grant Line Canal [47]	Pixley Slough [89]	Whiskey Slough [137]
Highline Canal [146]	Potato Slough [90]	White Slough [138]
Holland Cut [52]	Rhode Island [93]	Woodward Canal [140]
Honker Cut [53]	Rock Slough [94]	Yosemite Lake [142]
MOKELUMNE/COSUMNES RIVERS		
Bear Slough [5]	Dry Creek [Mokelumne R. trib.] [31]	Lost Slough [69]
Cosumnes River [20]	Grizzly Slough [48]	Mokelumne River [78]
MARSH CREEK		
Deer Creek [24]	Main Canal [Indian Slough trib.] [71]	Rock Slough [94]
Dry Creek [Marsh Creek trib.] [30]	Marsh Creek [72]	Sand Creek [99]
Kellogg Creek [58]		
SACRAMENTO RIVER		
Babel Slough [2]	Little Potato Slough [65]	Stone Lakes [112]
Beaver Slough [6]	Lost Slough [69]	Sutter Slough [114]
Cache Slough [14]	Main Canal [Duck Slough trib.] [70]	Sycamore Slough [116]
Dead Horse Cut [23]	Miner Slough [77]	Taylor Slough [Elkhorn Slough tributary] [117]
Delta Cross Channel [25]	Mokelumne River [78]	
Duck Slough [32]	Morrison Creek [80]	The Meadows Slough [121]
Elk Slough [34]	North Mokelumne River [84]	Tomato Slough [126]
Elkhorn Slough [35]	Sacramento River [96]	Upland Canal [Sycamore Slough tributary] [130]
Georgiana Slough [46]	Snodgrass Slough [108]	
Hog Slough [51]	South Mokelumne River [109]	Winchester Lake [139]
Jackson Slough [57]	Steamboat Slough [110]	

TABLE A43-2: DELTA AND YOLO BYPASS WATERWAYS BY METHYLMERCURY ALLOCATION SUBAREA, *Continued*

Waterway Name [Map Label #]	Waterway Name [Map Label #]	Waterway Name [Map Label #]
SAN JOAQUIN RIVER		
Crocker Cut [21]	Middle River [75]	San Joaquin River [98]
Deuel Drain [144]	Mountain House Creek [82]	Sugar Cut [113]
Doughty Cut [29]	Old River [86]	Tom Paine Slough [125]
Fabian and Bell Canal [38]	Paradise Cut [87]	Walker Slough [132]
French Camp Slough [45]	Red Bridge Slough [92]	Walthall Slough [133]
Grant Line Canal [47]	Salmon Slough [97]	
WEST DELTA		
Big Break [7]	Horseshoe Bend [54]	San Joaquin River [98]
Broad Slough [10]	Marsh Creek [72]	Sand Mound Slough [100]
Cabin Slough [13]	Mayberry Cut [73]	Sherman Lake [105]
Donlon Island [28]	Mayberry Slough [74]	Taylor Slough [near Franks Tract] [118]
Dutch Slough [33]	Rock Slough [94]	
Emerson Slough [36]	Sacramento River [96]	Threemile Slough [123]
False River [39]		
YOLO BYPASS-NORTH [(a)]		
Cache Creek Settling Basin Outflow [147]	Toe Drain [124]/Tule Canal [150] Putah Creek [149)]	Sacramento Deep Water Ship Channel [95]
Knights Landing Ridge Cut [148]		
YOLO BYPASS-SOUTH [(a)]		
Alamo Creek [1]	Liberty Cut [60]	Sweany Creek [115]
Babel Slough [2]	Lindsey Slough [61]	Sycamore Slough [116]
Barker Slough [3]	Lookout Slough [68]	The Big Ditch [120]
Cache Slough [14]	Miner Slough [77]	Toe Drain [124]
Calhoun Cut [16]	Prospect Slough [91)]	Ulatis Creek [129]
Duck Slough [32]	Sacramento Deep Water Ship Channel [95]	Wright Cut [141]
Haas Slough [49]		
Hastings Cut [50]	Shag Slough [103]	

(a) Both the "Yolo Bypass-North" and "Yolo Bypass-South" subareas contain portions of the Yolo Bypass flood conveyance channel shown in Figure IV-4. When flooded, the entire Yolo Bypass is a Delta waterway. When the Yolo Bypass is not flooded, the Toe Drain [127] (referred to as Tule Canal [C] for its northern reach), Cache Creek Settling Basin Outflow [A], and Knights Landing Ridge Cut [B] are the only waterways within the Yolo Bypass hydrologically connected to the Sacramento River.

TABLE A
AGRICULTURE AND WETLAND METHYLMERCURY ALLOCATIONS

Delta Subarea Receiving Source Input	Source [a]	Existing Load (g/yr)	Percent Reduction Required	Load Allocation [b] (g/yr)
Central Delta	Agriculture	37	0%	37
	Wetlands	210	0%	210
Marsh Creek	Agriculture	2.2	83%	0.37
	Wetlands	0.34	83%	0.058
Mokelumne/ Cosumnes Rivers	Agriculture	1.6	49%	0.82
	Wetlands	30	49%	15
Sacramento River	Agriculture	36	44%	20
	Wetlands	94	44%	53
San Joaquin River	Agriculture	23	75%	5.8
	Wetlands	43	75%	11
West Delta	Agriculture	4.1	0%	4.1
	Wetlands	130	0%	130
Yolo Bypass [c]	Agriculture	19 [c]	84%	3.0 [d]
	Wetlands	480	84%	77

(a) The agricultural methylmercury allocations apply to agricultural return flows during the active agricultural season and do not include methylmercury loads in irrigation to and rainfall runoff from agricultural lands.

(b) Annual loads are expected to fluctuate with water volume and other factors. Allocations will be revised as necessary at the end of Phase 1 to include additional wet and dry year data.

(c) The Yolo Bypass subarea encompasses areas that drain to Cache Slough at the base of the Yolo Bypass flood conveyance channel, as well as the Yolo Bypass within and outside of the legal Delta boundary. The allocations for the Yolo Bypass-North and -South subareas (see Figure A43-4) were combined in this and following tables.

(d) The methylmercury allocation for agriculture in the Yolo Bypass subarea does not include agricultural areas in the Yolo Bypass outside of the legal Delta boundary because agricultural return water volume data were not available for these areas at the time the Delta methylmercury control program was developed.

TABLE B
MUNICIPAL AND INDUSTRIAL WASTEWATER
METHYLMERCURY (MeHg) ALLOCATIONS

PERMITTEE [a]	NPDES Permit No.	Phase 1 MeHg Concentration Limit [b] [c] (ng/l)	MeHg Wasteload Allocation [c] (g/yr)
Brentwood WWTP	CA0082660	0.06	0.14
California, State of, Central Heating / Cooling Facility	CA0078581	[d]	[d]
Davis WWTP [e]	CA0079049	0.61	0.12
Deuel Vocational Inst. WWTP	CA0078093	0.06	0.021
Discovery Bay WWTP	CA0078590	0.18	0.37
GWF Power Systems [d]	CA0082309	0.06	0.0052
Lodi White Slough WWTP	CA0079243	0.15	0.93
Manteca WWTP	CA0081558	0.22	0.38
Metropolitan Stevedore Company	CA0084174	[f]	[f]
Mirant Delta LLC Contra Costa Power Plant	CA0004863	[d]	[d]
Oakwood Lake Subdivision Mining Reclamation [g]	CA0082783	0.06	0.38 [e]
Rio Vista Northwest WWTP	CA0083771	[h]	[h]
Rio Vista WWTP	CA0079588	0.16	0.056
Sacramento Combined WWTP	CA0079111	0.24 [i]	0.24
San Joaquin Co DPW CSA 31 - Flag City WWTP	CA0082848	0.08	0.0066
SRCSD Sacramento River WWTP [h]	CA0077682	0.72	90
SRCSD Walnut Grove WWTP	CA0078794	2.2	0.13
Stockton WWTP	CA0079138	0.94	9.0
Tracy WWTP	CA0079154	0.14	0.77
West Sacramento WWTP	CA0079171	0.06	0.62
Woodland WWTP	CA0077950	0.06	0.40
Unassigned allocation for new discharges [j]	[Central Delta] [j]	[j]	0.30
Unassigned allocation for new discharges	[Marsh Creek]	[j]	0.12
Unassigned allocation for new discharges	[Sacramento River]	[j]	8.4
Unassigned allocation for new discharges	[San Joaquin River]	[j]	2.2
Unassigned allocation for new discharges	[West Delta]	[j]	0.57
Unassigned allocation for new discharges	[Yolo Bypass]	[j]	0.42

Table B Footnotes:

(a) If WWTPs regionalize or consolidate, their wasteload allocations can be summed.

(b) Implementation of a water conservation program in a WWTP's service area or additional reclamation by a WWTP could result in decreased effluent volume but increased effluent methylmercury concentration. During Phase 1, if a WWTP's annual average effluent methylmercury concentration increases due to implementation of a water conservation program but its annual average effluent methylmercury load does not increase, then it shall be considered in compliance with the Phase 1 methylmercury limit. The discharger shall submit a report to demonstrate compliance for Executive Officer approval.

(c) Methylmercury wasteload allocations apply to annual discharge methylmercury loads and Phase 1 methylmercury concentrations limits apply to annual average discharge methylmercury concentrations. The Phase 1 methylmercury concentration limits also shall apply in Phase 2 until facilities achieve their methylmercury wasteload allocations or other effluent limits established for Phase 2.

(d) Methylmercury loads and concentrations in heating/cooling and power facility discharges vary with intake water conditions. To determine compliance with the limits and allocations, dischargers that that use ambient surface water for cooling water shall conduct concurrent monitoring of the intake water and effluent. The Phase 1 methylmercury concentration limits and methylmercury allocations for such heating/cooling and power facility discharges are 100%, such that the discharge limits and allocations shall become the detected methylmercury concentration found in the intake water. GWF Power Systems (CA0082309) acquires its intake water from sources other than ambient surface water and therefore has a methylmercury allocation and Phase 1 concentration limit based on its effluent methylmercury.

(e) The City of Davis WWTP (CA0079049) has two discharge locations; wastewater is discharged from Discharge 001 to the Willow Slough Bypass upstream of the Yolo Bypass and from Discharge 002 to the Conaway Ranch Toe Drain in the Yolo Bypass. The Phase 1 methylmercury concentration limit and methylmercury load allocation listed in Table B apply only to Discharge 002, which discharges seasonally from about February to June. Discharge 001 is encompassed by the Willow Slough watershed methylmercury allocation listed in Table G.

(f) A Phase 1 methylmercury concentration limit and methylmercury wasteload allocation for non-storm water discharges from the Metropolitan Stevedore Company (CA0084174) shall be established in its NPDES permit once it completes three sampling events for methylmercury in its discharges. The Phase 1 methylmercury concentration limit shall be set equal to the 90th percentile methylmercury concentration calculated from its monitoring results. Its wasteload allocation is a component of the "Unassigned WWTP Allocation" for the Central Delta subarea.

(g) The Oakwood Lake Subdivision Mining Reclamation (CA0082783) allows flood-control pumping from Oakwood Lake, a former excavation pit filled primarily by groundwater, to the San Joaquin River. Discharge volumes and associated methylmercury loads are expected to fluctuate between wet and dry years.

(h) A Phase 1 methylmercury concentration limit and methylmercury wasteload allocation for the City of Rio Vista's Northwest WWTP (CA0083771) shall be established in its NPDES permit once it completes one year of monthly monitoring of methylmercury in its discharge. Its Phase 1 methylmercury concentration limit shall be set equal to the annual average effluent methylmercury concentration calculated from the first 12 months of its monitoring. If its annual average effluent methylmercury concentration is less than 0.06 ng/l, it shall have a methylmercury wasteload allocation equal to its annual average effluent methylmercury concentration multiplied by its maximum rated discharge volume. If its annual average effluent methylmercury concentration is greater than 0.06 ng/l, it shall have a methylmercury wasteload allocation based on a concentration reduction of 44%. If such a reduction would result in an average discharge methylmercury concentration less than 0.06 ng/l, it shall have a wasteload allocation based on a methylmercury concentration of 0.06 ng/l. Its wasteload allocation is a component of the "Unassigned WWTP Allocation" for the Sacramento River subarea.

Table B Footnotes (continued):

(i) The Phase 1 methylmercury concentration limit and methylmercury wasteload allocation for the Sacramento Combined WWTP (CA0079111) WWTP are based on the average methylmercury concentration observed in wet weather urban runoff (0.24 ng/l) and the WWTP's average annual discharge volume (464 million gallons per year / 1.3 mgd). The Phase 1 limit and allocation shall be re-evaluated after the Sacramento Combined WWTP conducts one year of discharge methylmercury monitoring.

(j) To account for the projected population growth in the Delta region and associated discharges from new municipal WWTPs constructed in each Delta subarea, Table B contains unassigned wasteload allocations for new municipal WWTPs. New facilities that begin discharging during Phase 1 shall conduct monthly effluent monitoring for methylmercury and shall have Phase 1 methylmercury concentration limits set equal to the annual average effluent methylmercury concentration calculated from their first 12 months of monitoring, or 0.06 ng/l, whichever is higher. The Phase 1 methylmercury concentration limits shall be included in the NPDES permit.

TABLE C
NPDES PERMITTED FACILITIES REQUIRED TO CONDUCT PHASE 1 METHYLMERCURY CHARACTERIZATION AND CONTROL STUDIES AND TO MAINTAIN METHYLMERCURY LIMITS AND TOTAL MERCURY MINIMIZATION PROGRAMS

Facility (NPDES Permit No.)	Required to Conduct Phase 1 Methylmercury Characterization & Control Study	Phase 1 Methylmercury Concentration Limit [a] (ng/l)	Required to Implement a Total Mercury Minimization Program
Facilities within the Delta & Yolo Bypass North of the Delta			
Brentwood WWTP (CA0082660)		0.06	√
California, State of, Central Heating/ Cooling Facility (CA0078581)		[b]	
Davis WWTP (CA0079049), discharge to Toe Drain [c]	√	0.61	√
Deuel Vocational Inst. WWTP (CA0078093)		0.06	
Discovery Bay WWTP (CA0078590)		0.18	√
GWF Power Systems		0.06	
Lodi White Slough WWTP (CA0079243)		0.15	√
Manteca WWTP (CA0081558) [c]	√	0.22	√
Metropolitan Stevedore Company (CA0084174)		[d]	
Mirant Delta LLC Contra Costa Power Plant (CA0004863)		[b]	√
Mountain House CSD WWTP (CA0084271) [c]	√	[d]	√
Oakwood Lake Subdivision Mining Reclamation (CA0082783)		0.06	
Rio Vista WWTP		0.16	
Rio Vista Northwest WWTP (CA0083771) [c]	√	[d]	√
Sacramento Combined WWTP (CA0079111) [c]	√	0.24 [d]	√
San Joaquin Co DPW CSA 31 - Flag City WWTP (CA0082848)		0.08	
SRCSD Sacramento River WWTP (CA0077682) [c]	√	0.72	√
SRCSD Walnut Grove WWTP		2.2	
Stockton WWTP (CA0079138) [c]	√	0.94	√
Tracy WWTP (CA0079154) [c]	√	0.14	√
West Sacramento WWTP (CA0079171)		0.06	√
Woodland WWTP (CA0077950)		0.06	√
Facilities in the Tributary Watersheds Downstream of Major Dams			
Anderson WWTP (CA0077704)	√	0.09	√
Atwater WWTP (CA0079197)		0.06	√
Auburn WWTP (CA0077712)		0.06	√
Chico Regional WWTP (CA0079081)	√	0.16	√
Corning Industries/Domestic WWTP (CA0004995)		0.06	√
Davis WWTP (CA0079049) (discharge to Willow Slough)	√	0.55	√

TABLE C
NPDES PERMITTED FACILITIES REQUIRED TO CONDUCT PHASE 1 METHYLMERCURY CHARACTERIZATION AND CONTROL STUDIES AND TO MAINTAIN METHYLMERCURY LIMITS AND TOTAL MERCURY MINIMIZATION PROGRAMS, *CONTINUED*

Facility (NPDES Permit No.)	Required to Conduct Phase 1 Methylmercury Characterization & Control Study	Phase 1 Methylmercury Concentration Limit [(a)] (ng/l)	Required to Implement A Total Mercury Minimization Program
El Dorado Irrigation District (EDID) Deer Creek WWTP (CA0078662)		0.06	√
EDID El Dorado Hills WWTP (CA0078671)		0.06	√
Galt WWTP (CA0081434)	√	0.14	√
Lincoln WWTP (CA0084476)		0.06	√
Linda Co Water District WWTP (CA0079651)	√	[(d)]	√
Live Oak WWTP (CA0079022)	√	0.59	√
Merced WWTP (CA0079219)	√	0.39	√
Modesto WWTP (CA0079103)	√	0.12	√
Olivehurst PUD WWTP (CA0077836)	√	0.15	√
Oroville WWTP (CA0079235)	√	0.15	√
Placer Co. SMD #1 WWTP (CA0079316)	√	0.14	√
Proctor & Gamble Co. WWTP (CA0004316)		0.06	√
Red Bluff WWTP (CA0078891)		0.06	√
Redding Clear Creek WWTP (CA0079731)		0.06	√
Redding Stillwater WWTP (CA0082589)		0.06	√
Roseville Dry Creek WWTP (CA0079502)		0.06	√
Roseville Pleasant Grove WWTP (CA0084573)		0.06	√
Turlock WWTP (CA0078948)		0.06	√
University of California, Davis WWTP (CA0077895)		0.06	√
Vacaville Easterly WWTP (CA0077691)		0.06	√
Yuba City WWTP (CA0079260)	√	0.30	√

(a) Phase 1 methylmercury concentrations limits apply to annual average discharge methylmercury concentrations. The Phase 1 methylmercury concentration limits also shall apply in Phase 2 until facilities achieve their methylmercury wasteload allocations or other effluent limits established for Phase 2.

(b) Methylmercury loads and concentrations in heating/cooling and power facility discharges vary with intake water conditions. To determine compliance with the methylmercury concentration limit, the discharger shall conduct concurrent monitoring of the intake water and effluent. The Phase 1 methylmercury concentration limits for heating/cooling and power facility discharges are 100%, such that the discharge limits shall become the detected methylmercury concentration found in the intake water.

(c) These facilities also shall comply with the requirements specified under the "Risk Management Program".

(d) To be determined or refined by Phase 1 monitoring. The Phase 1 methylmercury concentration limits shall be established in NPDES permits.

TABLE D
MS4 METHYLMERCURY WASTELOAD ALLOCATIONS BY DELTA SUBAREA

Permittee	NPDES Permit No.	Existing Load (g/yr)	Percent Reduction Required	Wasteload Allocation [a, b] (g/yr)
Central Delta				
Contra Costa (County of) [c]	CAS083313	0.75	0%	0.75
Lodi (City of)	CAS000004	0.053	0%	0.053
Port of Stockton MS4	CAS084077	0.39	0%	0.39
San Joaquin (County of)	CAS000004	0.57	0%	0.57
Stockton Area MS4	CAS083470	3.6	0%	3.6
Marsh Creek				
Contra Costa (County of) [c]	CAS083313	1.2	75%	0.30
Mokelumne River				
San Joaquin (County of)	CAS000004	0.045	49%	0.023
Sacramento River				
Rio Vista (City of)	CAS000004	0.014	44%	0.0078
Sacramento Area MS4	CAS082597	1.8	44%	1.0
San Joaquin (County of)	CAS000004	0.19	44%	0.11
Solano (County of)	CAS000004	0.073	44%	0.041
West Sacramento (City of)	CAS000004	0.65	44%	0.36
Yolo (County of)	CAS000004	0.073	44%	0.041
San Joaquin River				
Lathrop (City of)	CAS000004	0.27	75%	0.068
Port of Stockton MS4	CAS084077	0.010	75%	0.0025
San Joaquin (County of)	CAS000004	2.2	75%	0.55
Stockton Area MS4	CAS083470	0.50	75%	0.13
Tracy (City of)	CAS000004	1.8	75%	0.45
West Delta				
Contra Costa (County of) [c]	CAS083313	3.2	0%	3.2
Yolo Bypass				
Solano (County of)	CAS000004	0.085	75%	0.021
West Sacramento (City of)	CAS000004	1.1	75%	0.28
Yolo (County of)	CAS000004	0.33	75%	0.083

Table D Footnotes:

(a) Some MS4s service areas span multiple Delta subareas and are therefore listed more than once. The allocated methylmercury loads for all MS4s are based on the average methylmercury concentrations observed in runoff from urban areas in or near the Delta during water years 2000 through 2003, a relatively dry period. Annual loads are expected to fluctuate with water volume and other factors. Allocations will be revised at the end of Phase 1 to include available wet year data.

(b) The methylmercury wasteload allocations include all current and future permitted urban discharges not otherwise addressed by another allocation within the geographic boundaries of urban runoff management agencies, including but not limited to Caltrans facilities and rights-of-way (NPDES No. CAS000003), public facilities, properties proximate to banks of waterways, industrial facilities, and construction sites.

(c) The Contra Costa County MS4 discharges to both the Delta and San Francisco Bay. The above allocations apply only to the portions of the MS4 service area that discharge to the Delta within the Central Valley Water Quality Control Board's jurisdiction. Most of the MS4's service area falls within the San Francisco Bay Regional Water Quality Control Board's jurisdiction. Therefore, during Phase 1 of the Delta Mercury Control Program, the mercury control requirements approved by the San Francisco Bay Regional Water Quality Control Board (Resolution R2-2006-0052) for the Contra Costa County MS4 will be applied to its service area within the Central Valley Regional Water Quality Control Board's jurisdiction. The methylmercury allocation for the Contra Costa County MS4 service area within the Delta will be reevaluated during Phase 2 of the Delta Mercury Control Program.

TABLE E
MS4S IN THE DELTA AND ITS TRIBUTARY WATERSHEDS DOWNSTREAM OF MAJOR DAMS REQUIRED TO IMPLEMENT BEST MANAGEMENT PRACTICES TO CONTROL EROSION AND SEDIMENT DISCHARGES

MS4 (NPDES Permit No.)	MS4 (NPDES Permit No.)
Anderson (City of) (CAS000004)	Merced (County of) (CAS000004)
Atwater (City of) (CAS000004)	Modesto (City of) (CAS083526)
Auburn (City of) (CAS000004)	Morada (CAS000004)
Butte (County of) (CAS000004)	North Auburn (CAS000004)
Calaveras (County of) (CAS000004)	North Woodbridge (CAS000004)
Caltrans (CAS000003)	Oakdale (City of) (CAS000004)
Ceres (City of) (CAS000004)	Oakley (City of) (CAS000004)
Chico (City of) (CAS000004)	Olivehurst (City of) (CAS000004)
Contra Costa (County of) (CAS083313)	Patterson (City of) (CAS000004)
Davis (City of) (CAS000004)	Placer (County of) (CAS000004)
Delhi (City of) (CAS000004)	Port of Stockton MS4 (CAS084077)
Dixon (City of) (CAS000004)	Redding (City of) (CAS000004)
El Dorado (County of) (CAS000004)	Rio Vista (City of) (CAS000004)
Empire (CAS000004)	Ripon (City of) (CAS000004)
French Camp (CAS000004)	Riverbank (City of) (CAS000004)
Fresno (CA0083500)	Rocklin (City of) (CAS000004)
Hughson (City of) (CAS000004)	Roseville (City of) (CAS000004)
Kennedy (CAS000004)	Salida (CAS000004)
Keyes (CAS000004)	San Joaquin (County of) (CAS000004)
Lathrop (City of) (CAS000004)	Shasta (County of) (CAS000004)
Lincoln (City of) (CAS000004)	Shasta Lake (City of) (CAS000004)
Linda (CAS000004)	Solano (County of) (CAS000004)
Livingston (City of) (CAS000004)	South Yuba City (CAS000004)
Lodi (City of) (CAS000004)	Stanislaus (County of) (CAS000004)
Loomis (City of) (CAS000004)	Sutter (County of) (CAS000004)
Los Banos (City of) (CAS000004)	Turlock (City of) (CAS000004)
Madera (City of) (CAS000004)	Vacaville (City of) (CAS000004)
Madera (County of) (CAS000004)	West Sacramento (City of) (CAS000004)
Madera Acres (CAS000004)	Winton (City of) (CAS000004)
Manteca (City of) (CAS000004)	Woodland (City of) (CAS000004)
Marysville (City of) (CAS000004)	Yolo (County of) (CAS000004)
Merced (City of) (CAS000004)	Yuba City (City of) (CAS000004)

TABLE F
OPEN WATER METHYLMERCURY LOAD ALLOCATIONS

Delta Subarea	Existing Load (g/yr)	Percent Reduction Required	Load Allocation [a] (g/yr)
Central Delta	370	0%	370
Marsh Creek [b]	0.18	83%	0.031
Mokelumne River	4.0	0%	4.0
Sacramento River	140	0%	140
San Joaquin River	48	0%	48
West Delta	190	0%	190
Yolo Bypass [b]	100	84%	16

(a) Open water methylmercury load allocations are based on methylmercury loading from sediment methylmercury production in open water habitat. The data were collected in May 2000 and October 2001, relatively dry periods. Methylmercury loading may fluctuate with water quality and volume and other factors during wet and dry years. Allocations will be revised as necessary at the end of Phase 1 to include available wet period data.

(b) Reductions will be needed in the open water methylmercury contributions to the Marsh Creek and Yolo Bypass subareas. These reductions will be achieved through reductions in tributary total mercury inputs.

TABLE G
TRIBUTARY WATERSHED METHYLMERCURY (MeHg) ALLOCATIONS

Delta Subarea	Tributary	Existing MeHg Concen-tration (ng/l)	Existing MeHg Load (g/yr)	Percent Reduction Required	MeHg Load Allocation [a, b] (g/yr)	MeHg Concen-tration Allocation (ng/l)
Central Delta	Bear/Mosher Creeks	0.31	11	0%	11	0.31
	Calaveras River	0.14	26	0%	26	0.14
Marsh Creek	Marsh Creek	0.25	1.9	82%	0.34	0.05
Mokelumne River	Mokelumne River	0.17	110	70%	33	0.05
Sacramento River	Morrison Creek	0.10	7.5	50%	3.8	0.05
	Sacramento River	0.10	2,000	50%	1,000	0.05
San Joaquin River	French Camp Slough	0.14	11	64%	4.0	0.05
	San Joaquin River	0.16	360	69%	110	0.05
Yolo Bypass	Cache Creek Settling Basin	0.50	140	90%	14	0.05
	Dixon Area	0.24	3.6	79%	0.76	0.05
	Fremont Weir	0.10	180	50%	90	0.05
	Knights Landing Ridge Cut	0.19	100	74%	26	0.05
	Putah Creek	0.18	11	72%	3.1	0.05
	Ulatis Creek	0.24	9.5	79%	2.0	0.05
	Willow Slough	0.24	18	79%	3.8	0.05

(a) Methylmercury allocations are assigned to tributary inputs to the Delta and Yolo Bypass. Mercury control programs designed to achieve the allocations for tributaries listed in Table G will be implemented by future Basin Plan amendments.

(b) Methylmercury load allocations are based on water years 2000 through 2003, a relative dry period. Annual loads are expected to fluctuate with water volume and other factors. Allocations will be revised at the end of Phase 1 to include available wet year data.

Revise Chapter IV (Implementation), under "Mercury Discharges in the Sacramento River and San Joaquin River Basins", under subsection "Cache Creek Watershed Mercury Program" to delete the last line in Table IV-6.1, 'Cache Creek Settling Basin Outflow' and to delete Footnote '(c)'.

Page intentionally left blank.